

American **FORESTS**

The Magazine of Forests, Soil, Water, Wildlife, and Outdoor Recreation

JUNE 1961

50 CENTS



POINT REYES: ISLAND IN TIME

SEE PAGE 12

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COVER

Land and water—into infinity! That is what lovely Point Reyes, California, offers to civilization if Congress will only move promptly in setting the area up as a proud National Seashore Park. As with Cape Cod, however, time is of the essence here. As shown in Bill Morse's fine cover photo of the encroachments have already begun as witness the power line across the top of this otherwise unspoiled landscape. Millions of Americans are already calling for action on this and the time to act is now.

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Forest Forum

AFA's Reasonable Position

EDITOR:

In your article on "poor judgment" in wilderness, I noticed that you mentioned some 1000 persons had dropped their membership in The American Forestry Association due to your stand on the wilderness bill.

As a forester I am painfully aware of the controversy over this bill and I have been keeping track of its progress with interest. It is my opinion as well as that of many other foresters with whom I have spoken that the stand taken by The American Forestry Association is the most reasonable to date. Your proposed amendments should make the bill acceptable to all but the most obstinate wilderness advocates.

You are to be congratulated for sticking by your decision in the face of unworthy criticism. I am glad to see that there is one organization of which foresters are an integral part that will take a definite stand on a controversial issue without flinching when it is attacked. We need more organizations like this.

Richard G. Reid
410 S. Lilly Street
Moscow, Idaho

Inaccuracy Cited

EDITOR:

I just saw the April issue of AMERICAN FORESTS. As chairman of the Puget Sound Section of the Society of American Foresters, I appreciate the coverage you gave in this issue to our statement opposing S. 174 presented at the recent "wilderness bill" hearings.

There is, however, an inaccuracy in the article that I would like to have corrected, since, as a professional forester, I regard it as serious.

The subject paragraph read: "The forester told the committee that blanketing wild and primitive areas into a wilderness system without first making exhaustive studies of the areas and their inter-relationship with other lands would represent bad professional judgment and that no reasonable professional could support such a proposal in good conscience."

The first part of this statement is generally correct but I never said or ever seriously implied that "no reasonable professional could support such a proposal in good conscience." I do, in fact, know a few "reasonable professionals" who support the proposal and in "good conscience."

Although we haven't taken a ballot on the specific point, I feel safe in saying that an overwhelming majority of our members strongly believe that any new legislation on the wilderness problem is unwise pending the report of the O. R. R. C.

A. F. A. is to be congratulated for taking a considered stand on a controversial issue

like wilderness legislation even though they knew such a stand might cause the association to lose members.

Jay Gruenfeld
Chairman
Puget Sound Section, SAF
P. O. Box 1645
Tacoma 1, Wash.

Sidearms On and Ready

EDITOR:

I just want to tell you that I do appreciate very much the play you so graciously gave my statement on the Wilderness Preservation Bill in the April issue of AMERICAN FORESTS. This is particularly true because The American Forestry Association does not quite see eye to eye with me and Senator Anderson on the bill. I like to think, though, that the difference is academic and not on the principle of Wilderness Preservation.

I do feel very strong that we must have positive legislative protection for the national forest wilderness system if it is to be preserved. On the ground I see so much opposition from selfish, mercenary interests that I know the purely administrative policies on wilderness are in constant jeopardy.

I was a Forest Ranger 52 years ago when the fight against the Forest Service was so bitter that the Forest Supervisor instructed me and my fellow ranger never to go any where alone and never even step outside our door without our sidearms on and ready. The oratory against wilderness preservation has been just as bitter. I know what the stockmen, miners and some lumbermen would do to the wilderness if they could.

Anyway I sincerely appreciate your handling of my statement, made from the bottom of my heart, on the Wilderness Preservation Bill. . . .

Elliott F. Barker
343 Palace Avenue
Santa Fe, New Mexico

Problem in Sociology

EDITOR:

Comment on your editorial, "Fire Weather Ahead," AMERICAN FORESTS, April 1961:

Like so many foresters you apparently think of controlling fires after they start—more research on crown fires, getting tough with fire setters. This is important, of course. But the real issue is preventing fires. After fifty years we still don't know why people start fires. It is a problem in sociology and psychology—not forestry.

Public agencies push hard for funds to develop fire control techniques but are indifferent to prevention research. In part, the reason may be that specialists outside the field should do the work and we either

do not understand or mistrust their approach.

In the long run we'd be better off to spend an equal sum for prevention research for every dollar used to develop new control devices.

Richard C. Smith
Professor of Forestry
University of Missouri
Columbia, Mo.

Fire Report

EDITOR:

Your story on the Lake States Forest Fire Research Conference held in Green Bay during March was splendid. National recognition of the fire research problem in the Lake States will provide added impetus for the goals we hope to achieve. When the 1,000 reprints arrive, we will indeed see that they are distributed throughout the region. They will prove valuable especially in light of the recommendations made at the conference.

The entire issue and its focus on fire is the added stimulus the nation needs at this time.

Mully Taylor
Trees for Tomorrow
Merrill, Wis.

Minnesota Lands

EDITOR:

How can we ever thank you enough for the wonderful way you handled the "Minnesota Lands" issue of AMERICAN FORESTS? The letters added a great deal to the presentation and Monroe Bush's book review was a knockout. The issue is certainly making itself known locally. I have heard a lot of favorable comment. . . .

Henry T. McKnight
2500 First National Bank Bldg.
Minneapolis 2, Minn.

New Life Members

EDITOR:

About a year ago we decided to subscribe to AMERICAN FORESTS and have enjoyed the magazine so much that both my wife and I want to become Life Members of your fine organization. There are very few publications today that we can honestly say that we keep for their usefulness and yours certainly is the first on the list.

Several years ago we put in about 8000 pines and while this number is not great the annual growth and progress of these trees provides us with a great deal of pleasure and certainly will give our children a lot of happiness in years to come.

Please accept my check for \$150.00 and the knowledge that your organization has and will continue to, provide us with very valuable reading.

R. P. Nash, Jr.
Fairmont Road
Novelty, Ohio



A patriarch of the original herd at Trexler-Lehigh County Game Preserve

Where the Buffalo Roam

By ELEANOR A. SCHRAWDER

BUFFALO have been returned to the lovely Trexler-Lehigh County Game Preserve in Pennsylvania. A second outbreak of tuberculosis in four years had brought about the destruction of the entire original herd which at one time numbered as high as seventy-five head and was the largest herd of American bison east of the Rockies.

Located approximately ten miles northwest of Allentown, the preserve was started by General Harry C. Trexler because he did not like to see large animals confined in small areas as in the zoological gardens.

Just fifty years ago, on March 3, 1911, the first buffalo were brought into Lehigh County. It proved to be an exciting time when one of the cows being unloaded went berserk

and attacked Mr. Phaon Hausman. Mr. Hausman was badly injured, but his life was saved by the quick thinking of the late Mr. James M. Snyder, then General Trexler's farm superintendent. Snyder dashed up and threw his heavy overcoat over the bison's head and Hausman was whisked to safety. Mr. Snyder received a Carnegie medal for heroism, the first time the award was made for saving a life from the fury of a wild animal.

General Trexler bequeathed the 1100-acre property and its wildlife consisting of herds of elk, buffalo, and deer to Lehigh County with a trust fund for its support approximately twenty-seven years ago. It is now operated by the county commissioners.

The herds of large animals roam at will over the rolling hills and grassy fields, watered by the picturesque Jordan River and enclosed by thirteen miles of fencing. A Tarvia road winds through the preserve and for a small fee it is possible to drive through this beautiful natural spot and see the animals at close range. There is also a small zoo located in the center of the preserve with species of wild deer, sheep, prairie dogs, and other unusual animals.

When the original herd of buffalo had increased to about seventy-five head, it was decided to reduce the number to fifty in order to prevent over-grazing of the fields. A number of young bulls were sold off each year for meat purposes and the Buffalo Inn, a small hotel located near the preserve, became known far and wide for its buffalo steaks.

About four years ago a fairly young buffalo died at the preserve, and a post mortem held to determine the cause of death showed the animal to be infected with tuberculosis. A test of the entire herd was made and thirty-eight were found to be infected and were destroyed. Only nine calves were retained.

Two years later the herd was increased by twenty-three head obtained from the United States Wildlife Service. There was no charge for the animals, but the shipping costs totaled \$1200.

Tuberculosis tests in March, 1960, disclosed that all but four or five head of those remaining were infected and it was with deep regret that the county commissioners were forced to order the complete destruction of the herd.

The source of the infection has remained a mystery, although it is believed to be somewhere on the preserve proper. An extensive study of the situation was made by local veterinarians and government agents.

The sheds where the buffalo were housed in bad weather and all feed bins, watering troughs, and other equipment were burned, grazing fields plowed, limed, and sprayed.

The county commissioners voted to purchase healthy bison as soon as the area received a clean bill of health from government inspectors. General Trexler's will specified that buffalo must be maintained at the preserve.

In the fall of 1960, an examination of the area was made by Dr. H. S. Smith of the Department of Agriculture. In view of the disin-

(Turn to page 50)

Reading
about

RESOURCES



By MONROE BUSH

Operation Wilderness

AS the United States population pushes fast toward the 200-million mark, we have suddenly been gripped by a new awareness of the value of wilderness. Open space—pure and undefiled open space—is seen as a prime asset for civilization, serving the compatible purposes of laboratory and Shangri-la.

The Wilderness Bill presently before the Congress is an illustration of this awareness. Irrespective of the bill itself, virtually all those who argue for or against it are equally mindful of the necessity for some method of continuing wilderness preservation—especially in respect to the wilderness areas of our national forests.

There are other signs of this rediscovery of wilderness. One is the aggressive planning taking place within certain states. Wisconsin, Minnesota, Michigan, New York, and Virginia, for example, either have already taken or contemplate steps which would further assure the maintenance of what wild land remains within their borders.

Other evidence of new interest is found in the continually expanding programs of such private organizations as the Nature Conservancy, the Wilderness Society, Wildlife Preserves, the Philadelphia Conservationists, and the Audubon Society, all of which share an intense dedication to the preservation of wilderness in its various aspects.

Here is evidence of a major, spontaneous movement. It has grown out of, and belongs in essence to, the earlier park movement. No wonder, then, that more and often better books on wilderness are appearing each year.

One major book deserves particular attention. It is Rutherford Platt's *Wilderness—The Discovery of a Continent of Wonder* (Dodd, Mead

& Co., New York, 1961. 310 pp. \$6.00). This is a superbly written account of the origins and characteristics of each of the vast wilderness areas that the explorers and settlers found as they pushed westward from their initial outposts on the Atlantic coast.

There is sound ecological reporting here, as well as a sensitivity to the men who opened the way. You meet the people who met the countryside, and see the wonders of the fresh continent with something of their viewpoint. They were both practical and appreciative men. Their concerns were elemental. They were often as raw as the landscape itself.

Rutherford Platt knows his natural history. The descriptions of each of the types of continental wilderness are authentic enough for any layman's use. But the data is so well "humanized" by the experiences and purposes of the pioneers on whom Platt reports that his book races with the speed of a good novel.

Without any implied criticism whatever, *Wilderness* must be considered a popularization. It was written for a wide readership. The book is not a scientific or scholarly contribution.

I would regard it as a valuable means for the education of the citizenry in the basics of wilderness. It warrants pushing by every conservationist who seeks a broader base of interest in society in the concept and use of wilderness. Here is a sharp tool for those of us committed to the maintenance of some pieces of wild nature. We should read Platt's book, of course. More than that, we should lend it to the lukewarm, we should keep every last copy in circulation.

An entirely different sort of work, *The Meaning of Wilderness to Sci-*

ence, has been published by the energetic Sierra Club of San Francisco (1960. 129 pp. \$5.75). This slim volume comprises the major papers delivered at the Sixth Biennial Wilderness Conference of 1959.

The contributions of such eminent men as Daniel B. Beard, Luna B. Leopold, and Frank Fraser Darling are meticulously correct, often laborious, and genuinely creative. Beard's piece on "Plants and Animals in Natural Communities" is one of the best in all respects, and particularly the most readable. Robert Rausch's lecture on "The Outlook for Conservation in Alaska" is pertinent and perceptive. We can only hope that it is being read in Alaska. Darling's "Wilderness, Science, and Human Ecology" is fundamentally important. I wish this were a separate pamphlet available for distribution by the tens of thousands.

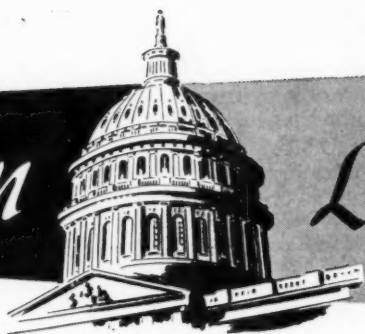
A book of this kind, so "unpopular" in its content, specialized and technical, feeds the professional just as the Platt book nurtures the Body Politic in general. Both are essential, and the wilderness movement has gained strength by this publication.

All writing cannot be, and should not be, so basic. We need casual, delightful books as much as we need the fundamental ones. What neither Platt nor the Wilderness Conference lectures could do is mildly entertain, divert, or stimulate to dreams. Neither the sweeping competence of one, nor the polished professionalism of the other, can carry the weary mind a thousand miles away.

The two men who can do this are Sigurd F. Olson and William O. Douglas. Olson's new book, *The Lonely Land* (Knopf, New York, 1961. 274 pp. \$4.50), is the recreation through five hundred miles of the Churchill River of the original

(Turn to page 52)

Washington



Lookout

By ALBERT G. HALL

A NATURAL RESOURCES ROAD ACT IS PROPOSED BY

Representative Harold T. Johnson of California, which among other things would establish the multiple use concept on lands administered by the Bureau of Land Management. While providing for increased authorizations for the several types of public roads serving federal and Indian lands, the bill would establish a new road category, "public land development roads and trails." In this new category would be roads "of primary importance for the development of the natural resources, including forests, minerals, outdoor recreation, range, water, wildlife, and fish on lands administered by the Bureau of Land Management." The measure also includes provision for a Natural Resources Road Commission, composed of the Secretaries of Commerce, Agriculture, and the Interior. The commission would serve to coordinate road building programs affecting lands in public ownership. Also sought in the bill, H.R. 6758, is the access road and right-of-way authority for the U.S. Forest Service, proposed in S. 501 by Senator Wayne Morse of Oregon. It would provide for the charging of user fees on national forest roads, and permit exchanges of easements, hauling rights, and rights-of-way between the Forest Service and private owners of adjacent lands.

A NEW CATEGORY OF FEDERAL LAND WOULD BE

established by Representative Clem Miller of California. His proposal, in H.R. 6793, would set up the King Range National Conservation Area in California to be managed under a program of "balanced usage." In the words of the bill, balanced usage would imply "utilization of the resources on an area in such a manner as to satisfy all legitimate requirements for the available resources as fully as possible without undue denial of any of such requirements and without undue impairment of any of the resources, taking into consideration total requirements and

total availability of resources, irrespective of ownership or location." In further explanation, the bill proposes zoning of uses, sustained yield of products and services, including water, recreation, forest products, wildlife, and geological resources (minerals). If established, this area would be a multiple use exhibit in which an attempt would be made to satisfy, or at least to coordinate, all possible demands against a specific land area.

PILOT STUDIES ON CHARGES FOR NATIONAL FOR-

est recreation were recommended by the newly established Advisory Committee on Multiple Use of the National Forests at the committee's first meeting early in May. The 15-man citizens' committee, appointed by Forest Service Chief Richard E. McArdle, indicated that charges might be considered for highly concentrated picnic and camp areas. It did not favor over-all charges such as entrance fees or recreation licenses. The committee also advised against extensive expansion of wilderness areas, and urged that present wilderness areas be protected against damage from heavy use.

A BROAD PROGRAM FOR SMALL WOODLANDS IS BEING

developed within the Department of Agriculture, by direction of the Secretary, Orville L. Freeman. Not only the U.S. Forest Service, but other agencies dealing with education and services to agriculture have been asked to cooperate in the development of a workable program. No details of the types of activities that may be included are now available, but it is understood that the numerous program proposals discussed earlier are being considered. (See report on proposals made by a Forest Service task force, reported in this column, December, 1960, and President Kennedy's farm message, reported April, 1961.) It is expected that an approved program will be readied before Congress recesses for the summer.

(Continued on next page)

MENOMINEE INDIANS, NOW FREE FROM FEDERAL

trusteeship, are the owners of a whole Wisconsin county, Menominee County, established from the tribe's 365-square-mile reservation. With assets valued at more than \$35 million, including some 200,000 acres of mixed conifer and northern hardwood forests, the tribe has established a corporation, Menominee Enterprises. Principal income of the enterprise will be from sustained-yield management of the timber and the operation of a sawmill, and possibly other processing facilities. President of Menominee Enterprises is Leo V. Bodine, formerly executive vice president of National Lumber Manufacturers Association, and recently in charge of Northwest operations for Diamond National Corporation. To help the Menominees make the transfer from trusteeship to full citizenship, two measures are now before the Congress to provide for loans for development of their resources, including recreational development, and for schools, health, and welfare services.

TWO OTHER INDIAN GROUPS, SCHEDULED FOR RE-

lease from federal trusteeship, the Colville Confederated Tribes and the Yakima Tribes, both in the state of Washington are timberland owners. Under two bills, introduced, by request, by Representative Thor C. Tollefson of Washington, H.R. 6801 and 6802, the timberland of these two reservations would be appraised by the Secretary of the Interior and the Secretary of Agriculture in operable units and offered for public sale. Lands not purchased by private bidders within one year would be purchased by the federal government for inclusion in the national forest system.

A POLLUTION CONTROL BILL HAS PASSED THE

House. H.R. 6441, a bill developed by the Committee on Public Works, replaces several amended bills which were being considered. As passed, the bill provides for the establishment of a Water Pollution Control Advisory Board within the Department of Health, Education, and Welfare; and increases the annual authorizations for construction grants from \$50 million to \$100 million for a 10-year period. Maximum federal participation in any project is raised from \$250,000 to \$800,000, and grants to states and interstate groups for water pollution control programming are increased from \$3 million to \$5 million.

PRESERVATION OF OPEN SPACE IN AND NEAR URBAN

areas is being sought in several House

and Senate bills. Purpose is to provide federal loan authority, in some bills, and federal grants in others, to assist state and local governments in the acquisition of lands to be preserved for economic, social, conservation, recreational, or aesthetic reasons.

UNTENDED SOIL BANK LANDS ARE FIRE HAZARDS,

the Congress has been told by the Brown County, Wisconsin, Board of Supervisors. Areas permitted to grow up in "soil saving" vegetation or planted to trees, rather than being kept in agriculture, the board points out, are very hazardous in the dry spring and fall months, and endanger Wisconsin forests and rural homes. In directing this to the attention of Congress, through Senator William Proxmire, the board asks that future soil bank contracts require 50-foot disced fire breaks around former croplands and around woodlots, woods, tree-planted areas, or wildlife areas.

NEW FORESTRY CHIEF, BUREAU OF LAND MANAGE-

ment, is Eugene V. Zumwalt who has been assistant BLM administrator in Alaska. He succeeds Walter H. Horning as forestry staff officer. Horning, BLM's top forestry staff officer for the past 12 years and scheduled for retirement at the end of this year, has been assigned to study and evaluate BLM's forestry activities and practices in western Oregon. Zumwalt began his BLM career in 1953, and prior to that time had been an assistant professor of forestry at Yale School of Forestry.

SECRETARY OF THE INTERIOR UDALL ON MAY 16

suggested a one-cent tax on soft drinks or cigarettes as a possible way of financing a massive national outdoor recreation program. In an interview with newsmen, the Secretary listed other possibilities of financing the program: fees paid by those who use federal parks and recreation areas, taxes on manufacturers who benefit from these places, and the possibility of a two billion dollar bond issue with bonds retired by special taxes or fees. The nation today faces its last chance during the next decade to save 23 to 28 million acres needed for parks, recreation and wildlife areas, the Secretary said. The biggest effort and biggest costs would be in the East, he added. The bold proposal has already touched off explosive reaction from soft drink manufacturers. On the other hand, some AFA officials, including Dr. Wilson Compton, said they believe the soft drink tax proposal deserves serious study and consideration.

Where the Raindrops Fall!

BENEFITS continue to accrue from the pooling of effort on the part of national conservation organizations who sponsor the annual National Watershed Congress. The Eighth Congress, recently concluded at Tucson, Arizona, (see page 10) was the best attended, the most educational, and the most stimulating of any within the writer's memory. This must be a source of solid satisfaction to those selfless individuals from many organizations who have identified themselves with this effort. It must be particularly gratifying to the two remaining members of the original Congress Steering Committee, C. R. Gutermauth and John H. Jones.

In the opinion of Soil Conservation Service Administrator Don Williams, the Tucson conference may have represented the "turning point" for the Congress. We hope so. Certainly the prospects look brighter today for more decisive action in inaugurating needed land treatment and upstream improvements on the nation's small watersheds. The appropriations picture in Washington looks hopeful. This is due in part to the militant conservation objectives as enunciated by President Kennedy in his resources messages to the Congress. It is also due to the spadework of the previous Administration which started this effort. Consequently, the program already has a good start with more and more small valleys actually mended or on the mend. Finally, the steadfast effort of the National Watershed Congress itself has contributed much.

This is not to imply that this comparatively young program has it made. To do so would be a gross distortion. As revealed by an SCS survey, there are nearly 12,000 delineated watersheds in the nation suitable for projects under the Watershed Protection and Flood Prevention Act, the Small Reclamation Projects Acts, and similar programs. About 8,300 of them need project action for one or more purposes and many of them should be handled as multi-purpose projects. All told, the needed projects would embrace nearly a billion acres, or half the land area of the nation. That results achieved thus far represent a mere token effort is attested by the fact that the 53 million acres now covered by projects authorized for operations is just about five per cent of the area requiring such action.

While much remains to be done, it can today be reliably reported that the groundwork has been laid and the work started. What is needed now is muscle—lots of muscle—both from the Congress and from devoted workers laboring at the grass roots. Furthermore, there are indications that such action is forthcoming. More and more, the Watershed Congress is drawing a new type of worker into the conservation arena—men and women from both rural and small urban centers who appear to be thoroughly imbued with the so-called Williams Doctrine; namely, 1) that water management begins with land management, and 2) that watersheds are the natural management units of the water resource.

To the delight of those present at the Eighth Congress, Senator Kerr, of Oklahoma, referred to these toilers in the water field as "hydronauts" and we trust it is a name

that will stick and that their numbers may steadily increase until they become a vast army. The Watershed Congress itself can help in this drive by continuing to plan congresses like the one at Tucson—meetings that will fire up workers and recruit new workers. We, for one, will not soon forget the inspirational, earthy address by an Oklahoma banker, "Red" Males, as he told how the efforts of his fellow citizens on his watershed are helping to keep "the young folks at home," boosting crop yields, boosting farm income. His was a talk reminiscent of a Bennett. Tours of "Water Street, U.S.A.," and visits to Mt. Lemmon on the Coronado National Forest and the Tombstone watershed project further boosted the resolve of people at the Tucson Congress.

There are other benefits that accrue from this Congress. To our mind, the watershed has always represented the perfect geographic entity where multiple use land management seems to fall into a sensible pattern for rural and urban people alike. As such, this Congress is now becoming a sort of corner crossroads for conservation where people in different lines of conservation work can swap ideas and know-how.

Take forestry, for instance. While too few of us primarily interested in this work attend these meetings, those of us who do are certainly getting an earful, particularly from our good friends in the National Association of Soil Conservation Districts. While it isn't too difficult to convince these farm-oriented people that not all foresters necessarily come from Brooklyn, or other big metropolitan hubs, some are yet to be persuaded that most foresters—including consultants—are not primarily "big industry" or "big government" forestry-oriented. What we foresters ought to do, apparently, is to attend more Grange socials as well as the National Watershed Congress.

Aside from the drive to improve small watersheds and also as a part of it, these exchanges can be mutually productive as the campaign for a more total form of conservation continues. Our greatest conservation sins, one reflects sadly after reading Bernard Frank's great story on Indian conservation on page 16, have been on failures to integrate our plans and work more closely together as a team. Failure to do this in India may mean that the life expectancy of some big dams may be a mere 20 years, Mr. Frank states.

Unlike some, AFA has never had any quarrel with big dams if and when they are needed nor does it believe that the basic objectives of downstream engineers and foresters and soil conservationists are necessarily irreconcilable. AFA *does* believe that the most important task of all is controlling that raindrop where it falls up there on the forest and on the watershed. Failure to do that, ultimately, can negate all the work done below and render it useless. After reading Mr. Frank's article, we believe you will agree we Americans, with all our advantages, don't deserve much sympathy if we fail to control those raindrops where they fall and thus become the true custodians of this land in which we live. To do this, the small watershed program will need more muscle.

The "Hydronauts" C



Senator Robert S. Kerr, Oklahoma, gave stirring speech, "Countdown on Water." Senator jolted audience with statement that most Americans will soon be using "second hand or third-hand" water that has been purified at least several times

HE called them the "hydronauts." That was the term applied by Senator Robert S. Kerr, of Oklahoma, to all workers and supporters for the small watershed movement in America at the Eighth National Watershed Congress in Tucson, Arizona, last month. In speaking of the manpower and technical know-how that will be needed to care for the nation's water needs in future years, Senator Kerr said, "I predict that these 'hydronauts' will be as important to the development of our nation's future as the astronauts."

In a great water speech entitled "Countdown on Water" that was documented chapter and verse by descriptive slides and graphs, the chairman of the Senate Select Committee on Water told the enthusiastic audience that his group has definitely determined that the "nation's water supply, in relation to demands, is shrinking rapidly."

Withdrawals now are about 300 billion gallons daily, Senator Kerr said. "Based on medium projections of the population increase, by 1980 demands on the nation's water re-

sources will almost double, and they will triple by the year 2000."

Assuming that the nation's economy will continue to grow at the rate achieved in the past and that there will be relatively little change in the present methods of water use, Senator Kerr said the committee decided there are five major categories of effort needed for meeting prospective demands on a long range basis. These are:

"(1) We need to improve the regulation of stream flow through the construction of surface reservoirs and through better watershed management.

"(2) We must improve the quality of our streams through more adequate pollution abatement. I prefer the term 'water quality management' to pollution abatement, however.

"(3) We must make better use of underground storage.

"(4) More water-saving techniques must be developed in the field of irrigation, sewage treatment, and substitution of air for water cooling should be encouraged in areas of potential water shortage.

"(5) Greater support must be given research programs leading to cheaper desalting methods, weather modification, or other methods of increasing natural water yield."

Of the slides presented, the ones on pollution—or "water quality management" as the Senator refers to it—were the most striking and left their imprint etched in the minds of the viewers. Some of these were just plain ghastly including those right at our own front door in the Potomac River as it flows through the nation's capital. These scenes showed bubbles of scum filled with sewer gas rising from the bottom of Four Mile Run as it enters the Potomac from Virginia, a trash dump just upstream from the water intakes for the District of Columbia, blue-green algae the smell of which, as we know, is particularly offensive at Four Mile Run, untreated sewage floating into the Potomac from Rock Creek, sewage solids almost too indecent to show polite company—but shown anyway to prove that our

cities are now receiving approximately twice as much pollutant from municipal sewage systems as was considered safe in 1955, and other scenes equally repulsive.

It might be added that it is a mighty good thing Senator Kerr did not show these scenes right after lunch for the shock to the eye was accompanied in this particular case by the very pungent aroma from a freshly-fertilized landscape pattern at the convention headquarters that seeped through the windows and doors as the viewers watched this exhibition of "water quality management" in action. It all stank!

Senator Kerr said he was bitterly disappointed when President Eisenhower last year vetoed a clean water bill to expand the program launched in 1956. This year it is going to be different, he predicted, and quoted President Kennedy's statement on pollution to the Congress, namely, "... Current corrective efforts are not adequate. This year a national total of \$350 million will be spent from all sources on municipal waste treatment works. But \$600 million of construction is required annually to keep pace with the growing rate of pollution. Industry is lagging far behind in its treatment of waste."

The President specifically referred to Senate Bill 120 introduced by Senator Kerr as an approach to the problem. This bill would increase federal support for the construction of sewage disposal plants. It would also authorize an intensive five-year program of research in developing methods of treating sewage.

"We might as well face the brutal facts—we have to achieve virtually complete storage of river flows in most of our country to meet the water needs of this century," Senator Kerr said.

Last month saw America's first "astronaut" aloft in space and returning safely home. But what of the "hydronauts?" Have they orbited yet?

Well, there was no doubt that the Eighth National Watershed Congress was the biggest and most ex-

s'Come of Age

By JAMES B. CRAIG

citing yet. In the words of Soil Conservation Service Administrator Don Williams, a man not given to overstatement, "I think this Congress may represent the turning point."

Many people concurred, including President William E. Richards, of the National Association of Soil Conservation Districts, who wrote in his "Thursday Letter," "The Eighth National Watershed Congress . . . was the most successful, by all manner of measurement, of any since the Third Congress at Lincoln, Nebraska, in 1956. The attendance was greater than anyone had anticipated . . . the speakers knowledgeable and the tours to view Water Street, U.S.A. and the Coronado National Forest were both interesting and inspiring."

There were many encouraging signs at Tucson. First and foremost, it seems to us, is what appears to be the emergence of a brand new group in the conservation arena—lay citizens and technicians working on actual small watershed projects. These people give evidence of being fully imbued with the Williams Doctrine, namely: 1) that water management begins with land management, and 2) that watersheds are the natural management units of the water resource.

Another good development is the fact that groups working on projects are making a real effort to "get" next year's Congress in their own backyard. For instance, groups from both Louisiana and Pennsylvania made spirited bids for the 1962 Congress even as the Tucson meeting was in progress.

Another development is that as more and more completed watersheds are placed in nomination for awards, it becomes increasingly difficult to give a "Watershed Project of the Year" award. Actually, two were made this year, one going to the Mountain Run Watershed of Culpeper County, Virginia, and the Upper West Fork of Cypress Bayou Watershed in Bossier Parish, Louisiana. Both projects were equally fine in all respects and the runners up were almost equally as good.

A Tennessean, John S. Wilder, of Somerville, was named "Watershed Man of the Year." Mr. Wilder, an attorney and farmer, is also president of the Tennessee Association of Soil and Water Conservation Districts.

A special award was made at Tucson by the Soil Conservation Society of America to Arthur N. Pack, president of the Charles Lathrop Pack Forestry Foundation. Mr. Pack, the official host of the Congress in Tucson, was honored for his work in promoting sound forest and watershed management in the Southwest and the nation. The Arizona-Sonora Desert Museum and its famed "Water Street" exhibit visited

by the convention was made possible by Mr. Pack and his able assistant, William H. Carr.

Just how big a mending job do we face in healing the small watershed areas of our nation? In addressing himself to the recently-completed Conservation Needs Inventory of the SCS, Administrator Williams revealed "altogether, there are nearly 12,000 delineated watersheds of a size suitable for projects under the Watershed Protection and Flood Prevention Act, the Small Reclamation Projects Act, and similar programs. About 8,300 of them need project action for one or more purposes; and many of them, of course.

(Turn to page 59)

Photographs by William B. Morse



Watershed Congress group inspects "Water Street" at Arizona-Sonora Desert Museum

On excursion up Mt. Lemmon, group stops at Windy Point to view the scenery





This scene on Inverness Ridge shows brushy slopes and beach south of Drake's Bay. Cattle graze in the area



The Douglasfir on Inverness Ridge are beautiful, but are too full of limbs to make high-quality lumber



There are numerous short beaches on Point Reyes, separated by headlands

POINT REYES: I

GOING—Going—Gone! The familiar words of the auctioneer are not the story of Point Reyes—not yet. But conservationists of California believe they will be, unless Congress acts soon and establishes the Point Reyes National Seashore Recreation Area.

The fact that Point Reyes is available for seashore use is the most unbelievable part of the proposal. An area of 53,000 acres on the seashore, still used for ranching rather than housing developments, is not common on any coast. But, when the area is located only 24 miles from downtown San Francisco and within two or three hours travel time of more than three million people in the San Francisco Bay area, then the mere fact that Point Reyes is still vacant becomes the most significant as well as unbelievable factor. Conrad L. Wirth, Director of the National Park Service, says, "I know of no other large area in the United States near population centers that has been left so unaltered by the hand of man."

Point Reyes will not remain undeveloped for long. The Marin

County Planning Commission has been under strong pressures to approve housing developments on the area. Three subdivisions have been approved, and while no houses have been built, it is only a question of time until the suitable sites will look like the rest of the suburban San Francisco Bay region.

This is why conservationists of California are so concerned with legislation to establish the Point Reyes National Seashore during this session of Congress. There is a now-or-never quality that is present in much greater degree for Point Reyes than for many other recreation proposals. The heart of the Point Reyes area may soon be gone unless Congress acts.

Proposals to establish a national seashore at Point Reyes are not new—federal acquisition of the peninsula was recommended as early as 1935. Nothing was done, and the matter rested until the Pacific Coast Recreation Survey of 1959 again said that the area warranted national status and recommended immediate action by the county, state, and federal governments. Point

Reyes has been included in most of the seashore bills introduced in the last two sessions of Congress. A field hearing was held in the local area of Marin County in April, 1960, by the Senate Interior and Insular Affairs Committee. Current important proposals to establish a Point Reyes Seashore are spelled out in companion bills: HR 2775, introduced by Congressman Clem Miller of California's First District, and S 476, co-sponsored by California Senators Clair Engle and Thomas Kuchel. Hearings were held by both houses in late March of this year.

Like all national seashore proposals, this one has generated controversy. Opponents are generally the ranchers, resident on the area, and real estate interests looking toward subdivision and development. Proponents include nearly all groups interested in conservation and recreation. Two special organizations have been created in Marin County to lead the battle: the West Marin Property Owners Association to oppose; the Point Reyes Foundation to promote a national seashore.

The Point Reyes proposal is an

Photographs by William B. Morse



Drake's Bay and Drake's Estero, where it is believed that Sir Francis Drake landed in 1579. The white cliffs here reminded him of the famous white cliffs in England

AFA is urging that Point Reyes, like Cape Cod, be made a National Seashore Park—and that it be done without delay

Point Reyes Island In Time

By WILLIAM B. MORSE

issue where no participant is neutral. Since it will involve a major change in land status, let us examine the area and the more important issues. The Point Reyes peninsula is so large, so diversified, and of such recreational potential, that space precludes a complete discussion. However, the major issues can be listed and commented on in the available space.

A large issue in any proposed seashore recreation area is the matter of definition—what is a national seashore recreation area? The general public and often the opponents of the proposal consider that area a national park and base part of their case on what they call an attempt to lock up resources. Actually, a national seashore recreation area is a recreation use area; it will be used with emphasis on seashore recreation. Developments will be made for recreation, and uses incompat-

ible to a national park can be allowed on a national seashore. These uses will emerge gradually as populations grow and public demands change; the emphasis will be on use and recreation by the people, rather than preservation of scenic resources.

Point Reyes is one of the most diversified areas on the West Coast in topography, climate, landscape, and ecology. Sierra Club writers made the best short description of Point Reyes when they called it an *island in time*. It is a timeless island in geology, development, and economics.

The peninsula is bounded on the east by the San Andreas fault, focal point of many earthquakes, and on the west by the Pacific Ocean. Geologically, the peninsula is a granitic material not found east of the fault, but common in southern California. Geologists feel that over the eons,

Point Reyes has drifted northward; in fact, it still moves north an inch or two a year. The major land mass of the Point Reyes area is Inverness Ridge, lying directly west of the San Andreas fault. The ridge drops rather abruptly to the sea in the southern portion of the peninsula, but in the central and northern portions, it tapers into open, rolling downs, ending in dunes and the beach.

Inverness Ridge is timbered in the higher portion with Douglasfir and California's unique Bishop pines, while the lower slopes are covered with typical chaparral brush mixtures. The downs and dune areas are covered with a variety of forbs, grasses, and low shrubs. There is one grove of redwoods on the ridge, and a series of California oaks, maples, and the madrone are found below the fir zone.

Large salt water marshes and mud



The Double Point, located in the southern half of the seashore, provides striking scenery as the surf pounds against the rocks and narrow beaches. This area, however, would be unsuited for surf swimming

flats in the esteros and lagoons indenting the downs are wintering areas for many species of waterfowl and shore birds. A wide assortment of animal life inhabits the area, ranging from mountain lion and California sea lion to the smallest rodents.

There are 45 miles of seashore on Point Reyes, varying from the rugged rocks on the point and the pounding surf on a 14-mile beach to the wide beaches backed by white bluffs on the southern portions of the peninsula. An additional 28 miles of shore line are found in Drake's Estero, while several hundred acres of fresh water are found in Abbotts Lagoon on the north and nine fresh water lakes in the south.

The 53,000 acres proposed for the national seashore are one of the most diversified and beautiful areas of any shore. The Park Service lists the various cover types by acreage as follows:

Type	Acres
Forest	12,000
Chaparral brush	2,000
Dunes and cliff	3,000
Cultivated	1,500
Brush and grazing	34,500

Provisions have been made to exclude from seashore boundaries the

one state park, as well as to allow substantial expansion and growth land for the two towns adjacent to the seashore.

The Point Reyes peninsula is not, however, a new Eden, nor is every acre useful for every activity. A steep beach and pounding surf make the beaches north of Point Reyes lighthouse unsuitable for surf bathing. That activity will have to be confined to beaches south of the lighthouse. Point Reyes is foggy. The lighthouse, located 500 feet above the sea, is one of the foggiest locations in the nation. Down at the sea level, there is less fog, and as the approach to Inverness Ridge is made, fog decreases rapidly. Much of the attractive vegetation grows from moisture provided by the fog. This entire section of California coast, including portions of San Francisco, are subject to summer fogs; however, recreation and living continue.

There are two state parks near the proposed Point Reyes Seashore. Tomales Bay Park on the northeast boundary of the seashore has been excluded from the proposed seashore. Near the south boundary is Stinson Beach, one of the heavily utilized public beaches of California;

500,000 people used this area in 1959. Marin County has one small county-owned beach on Drake's Bay. A small private beach is open to the public on the northern portion of Point Reyes. Although the area is well served by county and private roads, these open beaches are the only places where access for public recreation is allowed.

Point Reyes is an area rich in history. The very name Drake's Bay comes from Sir Francis Drake, the first white man to land on this section of the California coast. Local historical groups have two distinct schools of thought as to the exact location of Drake's landfall in 1579. The Point Reyes group believes that Drake repaired his ship, the Golden Hinde, on the beaches of Drake's Bay from June 17 to July 23, 1579. The other school holds that this was done in San Francisco Bay. Both sides have good arguments, and settlement is not likely until the site of Drake's fort is located. Drake's own descriptions seem to favor the Point Reyes area; however, the copper medal nailed to a post when he formally took possession of the country he called "New Albion" was found near San Francisco Bay. Regardless of where Drake landed, he gave us

descriptions of a friendly Indian culture and an area teeming with deer and elk, and he left believing California was an English possession.

There are 113 known Indian village sites on the Point Reyes peninsula, and, although not all were inhabited at once, a fairly heavy aboriginal population is indicated. The Indians of Point Reyes fell under mission influence early, and they had been moved to the mission at San Raphael before the first land grant was made in 1834. Following this, several grants were made by Mexican governors, and titles began to shift. By the end of the late 1800's, the bulk of the peninsula was in two ownerships. The estates of these owners were parcelled and sold to the present owners in the late 1920's and '30's. Some of the present owners had been tenants for many years prior to that purchase.

The primary land use on Point Reyes is grazing. There are 59 persons owning property within the pro-

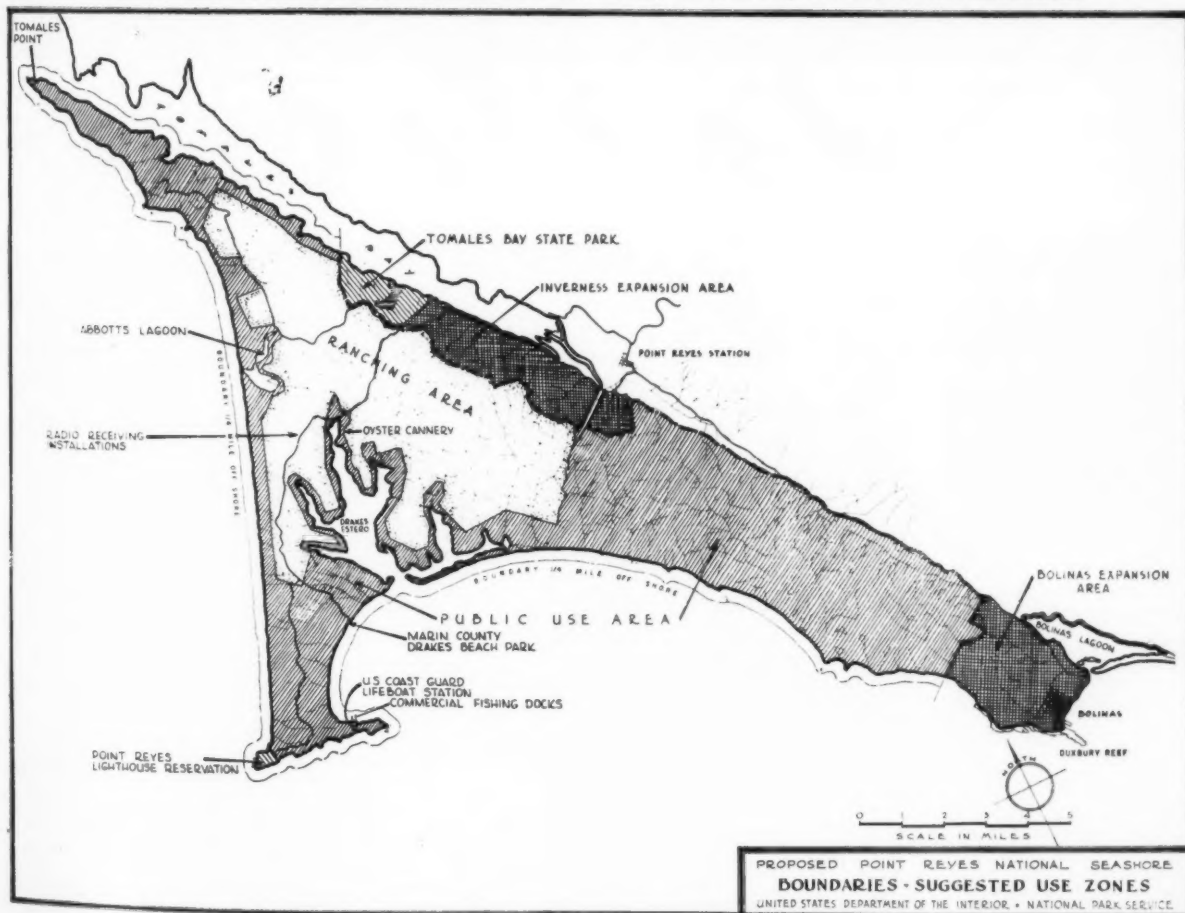
posed seashore boundaries; however, 99 per cent of the land is owned by 25 individuals or corporations. The only government land is the lighthouse and life boat station, and Marin County's 52 acres on Drake's Beach. The principal land use of the rolling northern portion of the peninsula is dairying; there are, on 15 ranches, about 3,175 cows in active milk production. The more precipitous southern ridges are devoted to beef production and furnish grazing for about 3,500 cattle. Two large overseas radio transmitting sites on the northern downs are the other major land use. The combined milk production of the herds on Point Reyes is not large compared to total production of Marin County. The importance of dairying has declined in Marin County as suburban developments increased. Whether dairying and nearby people are not compatible, or whether land economics force sales of dairy farms for higher priced residential use, it is

true that dairying interests move out as people move in. This seems to be the ultimate fate of the dairies on Point Reyes if the seashore is not established. Population pressure will divert land use from dairy to homes in a decade or two. However, seashore legislation now before Congress provides that not less than 20,000 acres of the seashore be designated as a pastoral zone for livestock grazing, and further provides that it be leased to ranchers. Most of this zone would be in the open northern half, where the dairies are located.

Dairying on Point Reyes is not year-round grazing of milk cattle. Seasonal use is made of the pastures, but a large part of the diet of the dairy animals is hay and feed concentrates shipped in from other areas. Heifers and the dry cows graze heavily. Much of the peninsula shows signs of overgrazing, a situation common on California's coastal dairy lands. Most of the ranches pro-

(Turn to page 62)

Proposed Point Reyes National Seashore, showing the various areas reserved for public use and recreation, ranching and grazing, expansion areas for nearby cities, and lighthouse and radio installations





Valley-hill relationships are starkly displayed below the Mussoori Ridge near Dehra Dun, U.P.

Water, Land, and People in

By BERNARD FRANK



Bernard Frank

Bernard Frank spent 12 months in India as an expert in Forest Influences for the Food and Agriculture Organization of the United Nations. His mission was to initiate forest influences and watershed management research on a national scale for the central government's Forest Research Institute and to cooperate with the several State Forest Services and Central Soil Conservation Board on watershed and soil and water conservation research.

ON November 23, 1960 the Supreme Court of India, in what will probably go down in history as an epochal decision, ruled invalid the laws of three states banning the slaughter of cattle. The highest judicial authority of this predominantly Hindu nation declared that such a ban was an unreasonable limitation on the rights of butchers (presumably Muslims who serve their beef-eating fellow Muslims) to practice their trade.

This decision will have little if any influence on the Hindu's taboo against eating beef. Rather, its significance lies in the fact that it may eventually lead to a tolerance of cattle control with all of the tremendous economic impacts such control would entail.

India's huge cattle herd represents one of that great nation's most debilitating burdens. This largely worthless livestock is the despair of foresters and other conservationists who vainly seek a modicum of protection against the overgrazing that contributes so much to soil movement and to the grievous damages from floods and sedimentation. Ninety per cent of her more than 215 million cattle, (60 per 100 humans—cattle actually outnumber the inhabitants in many villages!) do not even pay for their keep. According to the Indian Board of Agriculture, the maintenance of these useless animals represents an annual loss to their farmer-owners of some \$585 million.

However, the control of worthless

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cattle, even on a sizable scale would by itself ease India's tribulation only in part. That nation's land and water use and food production problems are much more complex than overgrazing alone.

Indian Government Concerned

Soil and water conditions on forest and brush lands—as well as crop and pasture lands—have become so unsatisfactory over such widespread areas as to cause concern at the highest levels of government. These conditions, which stem from causes of long standing, have been cumulative over the years and the effects have been correspondingly aggravated. Despite gains in some directions and localities, the adverse impacts of unstable land and water resources are rapidly increasing because: (1) the total population is expanding, and since the bulk of the people live in rural villages and depend directly on the soil, the pressure on the land is correspondingly intensified; (2) forest land is being utilized more intensively and made more accessible—not always in ac-

cord with the best soil and water conservation principles; (3) encroachment on the rougher, steeper, more erosive slopes and catchment areas continues unabated. These situations are well summarized by O. H. K. Spate, in *India and Pakistan: A General and Regional Geography*.

"Throughout central and southern India forest control is rendered extremely difficult by shifting cultivation, the complex intermingling of forest, often poor and open, with village lands, and immemorial rights of grazing, lopping, collecting leaf manure and minor produce. . . .

"The importance of the closely allied grazing, fuel, and manure problems cannot be over-emphasized; they lie at the very heart of India's rural crisis. There is a vicious circle; lack of firewood in the all but treeless plains enforces the use of cattle dung as fuel instead of manure; grazing areas are extremely limited and the pressure of cattle population on the scraps of village waste inhibits forest growth. The problems lock inextricably."

Further accentuating the problems is the fact that heavy investments are being made in costly dams and storage reservoirs, electric power facilities, roads and highways, irrigation facilities and land development, and in community developments. All this means that, unlike the past, the economic and social consequences of unstable catchments extend to enormous accumulations of values built up at great expense in human effort and materials. The effects are manifest in such forms as flood and sediment damages, waterlogging of expensively developed irrigation enterprises, in part through siltation from eroding uplands and streambanks, excessive siltation of reservoirs and abrasion of reservoir appurtenances, impaired water quality, water shortages and greater extremes of high and low flows.

In 1959, a Ford Foundation-sponsored team of top U.S. agricultural experts surveyed India's highly critical food requirements. It set up a number of targets to shoot at during the very short period of grace that

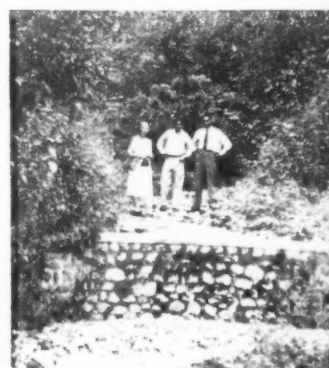
India



Group of Thujji villagers of Himachal Pradesh Himalayas

Costly works are needed to control torrential flows.

Huge loads of debris debouch into the Kosi from its numerous "kholas"



A divisional forest officer's quarters in Chakrata



Streambank stabilization research is vital to water control program



remains for that teeming sub-continent to escape serious shortages and possibly economic and political disaster. These targets were directly related to India's third Five Year Plan goals (1961-1966). The survey did not, of course, overlook the cattle problem. Nevertheless, as one would expect, their report—published by the government under the frank title "India's Food Crisis and Steps to Meet It"—could hardly find it politically expedient to suggest cattle slaughter. Instead, it had to content itself with recommending several round-about ways of reducing the excessive number that "competes with people for the products of the land."

No Blinking at Facts

Commenting on this report William Vogt, world-famed conservationist and author of the newly published book, *People!* rates it as "perhaps the most honest account of its kind yet produced, and it makes no pretense about what the Indian nation is up against. This is a 'blood, sweat and tears' commentary on human ecology." The report itself states that a target of 110 million tons of food "is reasonable" and must be reached by the end of the Third Five Year Plan—when the population will have risen to 480 million, "if the country is to go forward on its development program. In fact, greatly accelerated expansion of food production is necessary to prevent hunger and possible civil disturbance." This goal will require an increase in the rate of food production of 8.2 per cent during the 7-year period from 1959 to 1966, as against the actual rate of 3.2 per cent between 1952 and 1959.

Even at the more optimistic rate of increase of 4 per cent per year during the past decade cited recently by Prime Minister Nehru, and a total production of 75 million tons by the end of 1960, the goal of 110 million tons will likely be missed by about 10 million tons. Almost certain recurrence of calamitous floods or droughts, like those of 1950, which have periodically ravished the fertile plains and valleys, would widen this gap still more.

It is somewhat disheartening to observe that while Nehru cites a total increase in income of 42 per cent from 1956 to the present, the per capita increase is only 20 per cent, thus reflecting the dampening impact of the current rapid population growth on the national wellbeing. Sir Julian Huxley, addressing an International Conference on Population in New Delhi on "Population

Planning and Quality of Life" in February, 1959, commented quite bluntly on this situation. "Population control will not solve all our problems, but other problems will not be solved without it."

Concentration on crops alone, even to meet food needs, will definitely not suffice, as the Ford Foundation report so clearly warns. Food producing land, however stable, fertile, and well-watered, must be protected against the repetitive ravages of uncontrolled floodwaters and the huge quantities of coarse debris and sand these floods deposit on farms and in reservoirs. President Rajendra Prasad has estimated annual flood damages at Rs 550 Crore. (This sum is equivalent to over \$115 million at present exchange rates but it represents relatively a far greater encroachment upon India's total productive capacity than it would of ours.)

Strenuous Effort Started

These threats from uncontrolled waters are well recognized and strenuous efforts are being made to correct them. One of the most famous examples is the Kosi River Project, a cooperative venture between India and Nepal in land reclamation and irrigation. The notorious Kosi, India's "River of Sorrow," drains much of the Kingdom of Nepal, home of the intrepid Gurkhas of British Indian Army fame. Two tributaries, the Sun Kosi and Arun Kosi, rise on the shoulders of Mt. Everest itself. Only seventy-five hundred square miles of this 23,000-square mile drainage basin are below 10,000 feet in elevation. This lower, snow-free segment contains the Nepalese villages and farms and forests. Here uncontrolled and excessive livestock grazing and the usually destructive shifting cultivation dominate the rural scene. (The latter practice involves clearing the forest, which usually grows on highly erosive soils on steep, unstable shales and sandstones.)

Some of the least stable lands occur in the close vicinity of the water developments in the alluvial reach of the river just below its exit from the mountain gorge.

The unruly Kosi has produced flood rises of 30 feet in 24 hours. It carries so heavy a load of detritus and sand that despite discharges of about 200,000 cubic feet per second (in 1954 a maximum of 855,000 cfs occurred) the river has no permanent deep channel. Instead, it rips through the flat Ganges Plain in many shifting channels. Over a pe-

riod of 150 years the main channel has moved 70 miles westward, laying waste to about 8,000 square miles of once thriving farms.

The instability of the extremely young geologic formations is manifest in massive landslides, soil creep during dry periods, and stream bank cutting, all aggravated by abusive agricultural and forest practices. This situation represents a most formidable threat to the project's future, a threat that is compounded by the occurrence of an epicenter at Chatra, Nepal, in the immediate vicinity of the engineering works currently under construction.

When completed, the Kosi project—begun in 1955—is expected to permit the irrigation of 1.4 million acres in the Indian state of Bihar, plus 20,000 acres more in neighboring Nepal, and to permit reclamation of another 350,000 acres on the Indian side of the border. The authorities optimistically state that "the ultimate taming of the 'River of Sorrow' promises to usher in an era of plenty, progress, and prosperity in an area ridden with disease and distress for centuries." Altogether, these developments are slated to facilitate new food production totaling over 425,000 tons annually. This goal is to be accomplished at a combined cost for the diversion dam at Hanumannagar, Nepal, and the irrigation canal headworks, of \$34 million. The entire scheme is estimated to cost \$95 millions, but under the existing circumstances this figure can represent only the first installment of a continuing series of costs the violent geologic and climatic forces operating in this area make inevitable.

The Hanumannagar Barrage is designed to control silt and coarse debris, divert water to feed the irrigation canal system, and permit generation of 8,000 kilowatts of continuous power. Already completed is a system of levees extending 75 miles downstream from the barrage on both sides of the alluvial Kosi, and confining the river to a width of from 3 to 10 miles. As an immediate result, it has become possible to reopen to farming about 600,000 acres formerly laid waste by the sinuous wanderings of the Kosi.

Life Expectancy—20 Years!

The frightening aspect of this project is that the pool behind the barrage has an expected useful life of a mere 20 years! Engineers of India's Central Water and Power Commission estimate the rate of sediment production from the Kosi

drainage basin at 9 acre-feet per year, the highest in the world for any stream of comparable watershed area. (At 166 pounds per cubic foot for the coarse mineral materials involved, this volume is equivalent to nearly 33,000 tons.)

"Though the vast spill of floodwater has been controlled, the problem of arresting the huge silt load . . . will have to be solved," soberly admits the December, 1959, brochure of the Kosi Project administration. The limited possibility of constructing debris basins in the Himalayan gorge above the Hanumannagar Barrage in order to lengthen the useful life of its pool has created serious if unpublicized concern. The engineers recognize, of course, that the

high earthquake risk would make the success of such works very problematical. For this reason they have become greatly interested in the performance of the Montana Power Company's Hebgen Lake Dam on the Madison River in Montana, scene of the disastrous earthquake of August 17, 1959. This earth-filled structure displayed sufficient flexibility in absorbing the shocks to remain fairly intact, thus permitting its prompt repair. Also, the lessons learned from the Chilean earthquake of May, 1960, should yield additional valuable information on design and foundation specifications prevailing on the Kosi River and its tributaries.

Unless debris catchment dams ade-

quate to withstand earthquake shocks can be built, and supported by watershed conservation measures, it looks as if the Kosi Project—and with it the hopes of meeting the Ford Foundation team's food production goals—is doomed almost before the hopeful farmers are able to settle down in their new land of promise.

The contributions of debris from the Kosi's small mountain tributaries (locally known as "kholas") cannot be neglected in the long-range program. The Central Water and Power Commission's engineers estimate that although these local drainages comprise only 11 per cent of the entire Kosi basin they con-

(Turn to page 54)

The placid elephant, used extensively in farming, forestry and like activities, is ideal conveyance for swollen stream bottom



Traffic besides the Nangal Canal near the Bhakra Dam



Tough Nepalese navigate unruly and turbulent Kosi River 70 miles from Mt. Everest. The Kosi has no permanent channel, instead rips through flat Ganges Plain in many shifting gorges



The Forest Research Institute of India lies in the shadow of the Himalayas. Although much has been accomplished, emphasis is still on timber production



Old Meeting House at Sandwich, Cape Cod, noted for its Christopher Wren steeple, is seen here through a window of Historical Museum



Fishermen enter Vineyard Sound on the trail of bluefish, bass, and marlin

An aerial photograph of Provincetown Harbor shows the Pilgrim Monument, in the foreground, overlooking serene waters

CAPE COD has been, traditionally, a land which beckons pilgrims to her shores. It was in the snug harbor at Provincetown that the first Pilgrims found a safe haven. Since that fateful day, succeeding generations have felt the compelling urge to make their own pilgrimage to this favored land.

Perhaps the reason for this is the unique character of Cape Cod, a rural seaside community unspoiled by the hand of time and rich in legends of adventure and historic events—all wrapped up in a compact little peninsula that is caressed by the seas.

You first meet this little hook of land just before crossing Cape Cod Canal from State Highway 3 at Sagamore or six miles south at Bourne.

To most people, springtime is the popular season for exploration of the Cape. The highways and byways are uncrowded, and there is every facility for unhurried searching out of the interests and attractions which lure all pilgrims. And, quite as important, is the fact that spring is the "thrift season"—the finest of accommodations being available at 40 to 50 per cent below the summer schedule.

On the south shore (Nantucket Sound), bathing is good into September and fishing is never better than in June. Because of the Cape's peculiar geography, its oceanic



climate blesses it with cooler summers and warmer winters than most of New England.

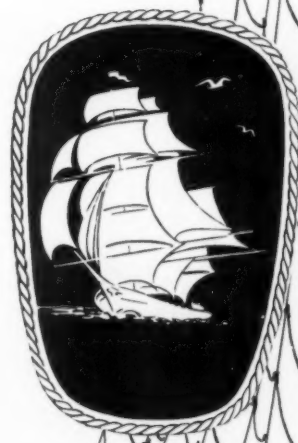
The lovers of the out-of-doors—fishermen, golfers, swimmers, and naturalists—roam the countryside's countless beaches, woodlands, bird sanctuaries, and fine golf courses which abound on the Cape. All seem to have an avid interest in the present restoration of places of historic significance and find time to search for these spots since no blatant signs announce their presence. But you cannot tread the soil of the Cape without a constant awareness that here history has been made.

Down a quiet street moves a small structure aboard a shallow conveyance. Only the inquiring soul would learn that it is a relic of bygone days being preserved—the hallowed Kelley Chapel being transported to land owned by the Dennis-Yarmouth Historical Society to be preserved for future generations. This little chapel was built by David Kelley as a place where his daughter, Rose, conducted *Bible* readings for the host of fishermen who frequented the port at Bass River. This is the type of activity which is going on in many parts of the Cape as the natives become increasingly aware of their rare historic treasures. And it has become of great interest to visitors.

You will like Ballston and Long

FOR ADVENTURE AND HISTORY

By RALPH T. BURCH



Nook Beaches near Truro which has refused to become anything like the carnival midway of Provincetown's main street. In fact, you will miss Truro altogether if you don't take the side-road off route 6 to explore the pastoral hills and valleys of Truro and nearby Wellfleet, once a famous whaling town. Slipped in among this unspoiled activity are homes, the Truro Town Hall, the Hill of Churches, the old Congregational Meeting House, and old Snow Cemetery.

Lighthouses are as natural to Cape Cod as the sea perils that necessitate them. All the quaintness and scenic beauty of the Cape cannot hide the stark need for aids to mariners along its dangerous coast. Fog, tides, shoals, hurricanes, and winter gales are all ingredients in the dramatic, often tragic, shipwreck history that centers in the lighthouses. From canal to Cape tip there are seven major lights, all under the jurisdiction of the United States Coast Guard. Each light has a colorful and picturesque setting with its own individual type beauty. The lights and grounds are spotlessly maintained, with well kept lawns and plantings wherever possible. Nauset Light is the former Chatham North Tower which was moved, in 1923, to its present North Eastham location. Automatically operated, Nauset is bright red on the upper half of the tower and white on the bottom half. The light vir-

tually adjoins one of Eastham's public beach parking areas, and the owner-keeper's house is now a vacation residence.

Race Point Light at Provincetown was first constructed in 1816 at one of the most dangerous stretches of water on the entire Cape Cod coast. A picturesque, dune-country light, this beacon is accessible only by large-tired beach buggy. One such vehicle makes tours of the area from Race Point Life Boat Station parking area, somewhat to the east of the lighthouse.

Beach buggies at Nauset Beach will take you out for long excursions—30 miles on the sand dunes from Orleans to Chatham. Many buggy addicts have their own vehicles, some with complete living facilities and canopied porches. To drive the dunes, oversize tires are dropped to about 8 pounds of air, depending on their load.

Fishing is, no doubt, the second biggest industry on Cape Cod, but tourism outweighs it. At Provincetown, these colorful Cape industries mingle until you can't tell one from another. On the famous town wharf, where the boat from Boston arrives, Portuguese fishermen, unloading their day's catch, will remind you of their bold ancestors who came down from the Azores to man the whaling boats and fishing schooners of the last century. If you're in Provincetown in late June, you will be in time for one of the Cape's most

colorful festivals—"The Blessing of the Fleet." This religious ceremony launches the new fishing season. After High Mass, the colorfully garbed fishermen parade through the town to their newly painted and decorated boats. The fleet of trawlers, draggers, scallopers, and trap boats then moves in dress parade slowly around the harbor.

If you're given to curios and bric-a-brac, Provincetown is a happy haven for you. Commercial Street, Provincetown's brassy lady, won't let you miss a thing—and some of her wares shouldn't be missed. The Pilgrims first landed in the New World along what is now bustling Commercial Street. They took one look and hurried right on to Plymouth—so they say. The 225-foot Pilgrim Monument marks Provincetown's pride that the Pilgrims came there at all. You can climb this granite shaft for a powerful view of the entire Cape End.

You must go along with the Cape and try a menu that's a delight to many people: clam chowder, boiled lobster with drawn butter, and home-grown-blueberry pie. You'll find boned bluefish at Hennessy's Steak House in Dennis Port, clam chowder at Latham's in Brewster, lobster coquille at the Dome Restaurant in Woods Hole, and corned beef at Dinty Moore's in Hyannis. In South Yarmouth they will feed you cranberries for two weeks without giving you the same dish twice.

Of course, the Cape practically invented cranberries. Not long after the natives stopped selling salt from the sea water they began mining these red nuggets that thrive in the great marshes of the peninsula. By the mid-nineteenth century, cranberry growing was an established industry.

Brewster, on old Route 6, is within speaking distance of one of the Cape's most attractive picnic and camping grounds, Nickerson State Park. Facilities at Nickerson, including even a grocery store within the park, are so complete that families find it hard to leave this enchanting forest of pines and wildlife to continue their planned tour of the Cape. One of the best of fresh water lakes and ponds is in the park—Cliff Lake. You will find the beach here rivals the ocean, and the fishing is good for trout, perch, and bass, as well as salmon.

The Cape has opened its salty arms to homes on wheels. There are some 50 privately-owned trailer

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America's first commercial enterprise was housed here at the Aptucxet Trading Post, Bourne, on Cape Cod Canal. Here, Pilgrims traded with Dutch from New Amsterdam



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The beautiful Potomac River must supply the ever-increasing water demands of the nation's capital

"POTOMAC PROSPECT"

Best prospect for the future of the Potomac Valley? Better conservation practices is the answer of this conservationist-oriented group that contends the Army Engineers don't necessarily have all the answers

AN interesting comparison and analysis of three proposals for the development of the Potomac Basin are presented in a booklet, *Potomac Prospect*, published by the Coordinating Committee on the Potomac River Valley. Although each study of the development problem indicates that prompt action is essential to insure an adequate future water supply for the nation's capital, each study has resulted in a basically different approach.

According to *Potomac Prospect*, "Each plan would result in a greatly different level of development for the entire basin for all time—and the differences would have such a profound effect upon the lives of the residents of the basin that the decision will be of momentous consequence." These plans, known as: 1) the Corps of Engineers' Plan; 2) the Wolman Plan; and, 3) the Coordinating Committee's Plan, are analyzed in the booklet as follows:

Basically, the Corps of Engineers' Plan proposes a series of large impoundments of water, located primarily on the main stem of the Potomac and the lower tributaries, which would provide sufficient supplement to the natural flow of the river to accommodate the needs for domestic and industrial water, for irrigation, for aesthetic purposes, and to "flush" pollution past the city of Washington, thus preventing septic conditions in the Upper Estuary. These dams would be built with their crests extending sufficiently above the normal pool levels to impound additional water during flood flows.

The Engineers have apparently concluded, the new study states, that the present pollution of our waterways is unpreventable and that it will become progressively worse as the region is developed. However, the proposal to "flush" the pollution past Washington would still result

in a dirty river and contribute to the destruction of its natural environment, the study contends.

The Wolman Plan is similar to the Engineers' in that it would not prevent pollution from being discharged into the river, and also advocates a series of impoundments. However, the Wolman Plan would provide a 30-mile tunnel, between the Washington, D. C. sewage treatment plant at Blue Plains and the Chesapeake Bay, to discharge the sewage effluent from the plant to the bay.

According to the Coordinating Committee, the Wolman Plan would only moderately reduce pollution in the river, but it would moderate flood flows and would provide for a supply of supplemental water adequate for domestic, industrial, and irrigation uses as well as to "flush" the reduced amount of pollution past the city.

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The Montford Creek natural area contains a stand that is 160 years old. The species included in this stand are western white pine, western hemlock, grand fir

The SAF'S

UNDISTURBED

FORESTS

By JOHN F. SHANKLIN

MANY people associate foresters with the task of repairing forests rather than keeping them undisturbed. Mostly that is right. Foresters crop trees. They find the time to plant a billion or so trees a year. They also fight fires, manage game and watersheds, and cater to the needs of millions of recreationists.

But that's not all. It might come as a surprise to many people to learn that foresters have also been guarding what are probably the most rigidly undisturbed forest areas on the face of the globe.

No, these are not wilderness or primitive areas or even national parks. Although well-managed for the purpose for which they were intended, there is entirely too much people traffic in all of these areas to conform with the stiff standards in the forest areas we are talking about.

We are referring here not to "national forest areas" but to "natural forest areas," and presently there are 128 of these in 34 states and Puerto Rico—all of which conform to the rigid standards that have been set up for them.

These areas have been set aside and are protected—managed, if you will—under the standards advocated by the Society of American Foresters. This is a professional group that provides the same type of services for foresters that the Ameri-

can Medical Association does for doctors.

How did the Society happen to get into the natural areas business? All good professional societies, among other things, set high standards for their members, insist on strong codes of ethics, and are always trying to look way ahead on the question of future needs.

No doubt, pioneer foresters gave some thought to the question, but with a wealth of virgin timber still close at hand, it probably was difficult to envision the time when it would be hard to find small samples of truly undisturbed forest. Whatever they may have thought, the first concrete proposals for the preservation of natural areas was, of course, restricted to the national forests and the kind of timberlands to be found therein.

Then, fourteen years ago, Dr. Shirley Allen, at the time president of the Society of American Foresters, together with the members of his governing council, following recommendations received from its Division of Silviculture, came to the conclusion that in the interests of future scholarship and research the Society had a responsibility to encourage the setting aside and preservation of forested areas in their virgin state or as close to their virgin state as possible, on all kinds of ownerships and in all kinds of forest types. Ad-

mitedly, the Society was getting a rather late start on this project and virgin forest was rapidly shrinking. To have waited longer would have been a case of too little, too late.

At this point you possibly are asking, "Just what is a natural forest area?" and "Aren't all forests natural except those planted by man?"

These are valid questions. Once again, permit us to remind you that the Society is not talking about wilderness, wild, primitive, roadless, or comparable types of forest areas. It defines a natural forest area as:

"An area set aside to preserve permanently in unmodified condition a representative unit of the virgin growth of a major forest type primarily for the purpose of science, research, and education. Timber cutting and grazing are prohibited and general public use discouraged."

You mean to tell us foresters are actually managing areas where there is no timber cutting, you ask? Yes, and no cattle or sheep, and most important of all, few, if any, recreationists. These areas are primarily the domain of a very small group—namely, the scholar and the scientist. And the criteria for the management of natural forest areas are, in effect, guidelines for protection against encroachment.

The best guideline is, "When in doubt as to what to do, leave the

area alone"—a guideline, by the way, that is religiously followed. Picnicking, camping, berry, nut, or herb gathering, plant collecting, and other public uses would contribute to modifying a natural forest area and might impair or limit the value of such an area for research purposes. Hunting, trapping, and fishing may be permitted, providing the intensity of such activities will not have a significant effect on the biotic community—and even these uses are considered secondary and are strictly limited.

Now, you understand, of course, that in a strict sense, no forest area of the United States today may be considered absolutely virgin. Practically without exception even the remotest forest area has in some small way, directly or indirectly, been influenced by man to the extent of modifying natural ecological trends and relations.

The Society follows certain guidelines in its consideration of areas submitted for approval.

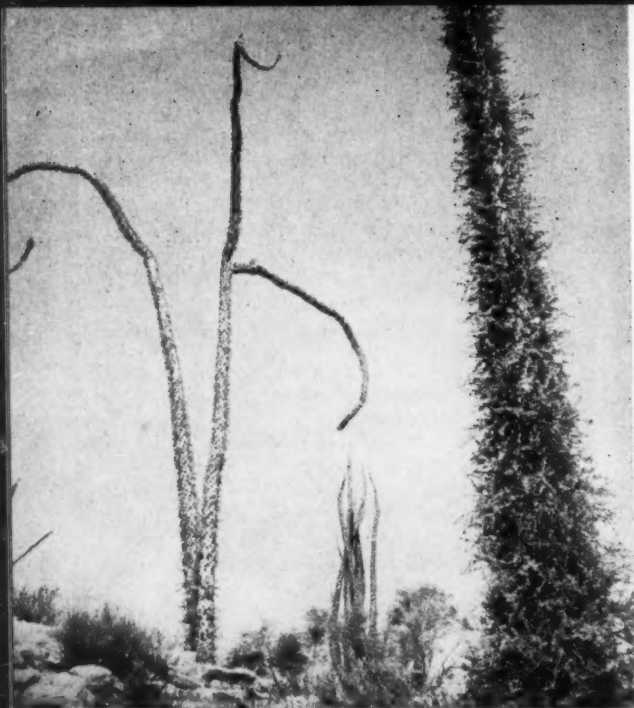
1. All recognized SAF forest type associations are included even though the definition emphasizes major forest types.

2. Emphasis is on virgin type associations. However, it is recognized that representative samples of a given type may be lacking and that true virgin areas may not be located. In

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This pure stand of pond cypress is part of a natural area in the Okefenokee National Wildlife Refuge in Georgia. Presently, there are 128 natural forest areas, located in 34 states and in Puerto Rico





Cirios, like other desert plants, are covered with thorns



Arch is actually a cirio that has grown back into ground

The Boojum Tree of Baja

By ARTHUR L. CENTER

CROSS the 28th parallel traveling north in Baja, California, and you will enter the fantastic forest of the cirios, the strangest and most striking desert plants in the world. Native only to this arid area of the Viscaïno Desert, 200 miles south of the United States-Mexico border, these botanical monstrosities are so rare that scientists have placed them in a class by themselves.

It has been called the "tree with a personality" because, like human beings, each individual plant develops differently upon maturity. Some continue to grow straight up, like a denuded pine tree; some branch out at the top into two, three, and even multi-fingered candlesticks; while a few will go to extremes and actually grow back into the ground.

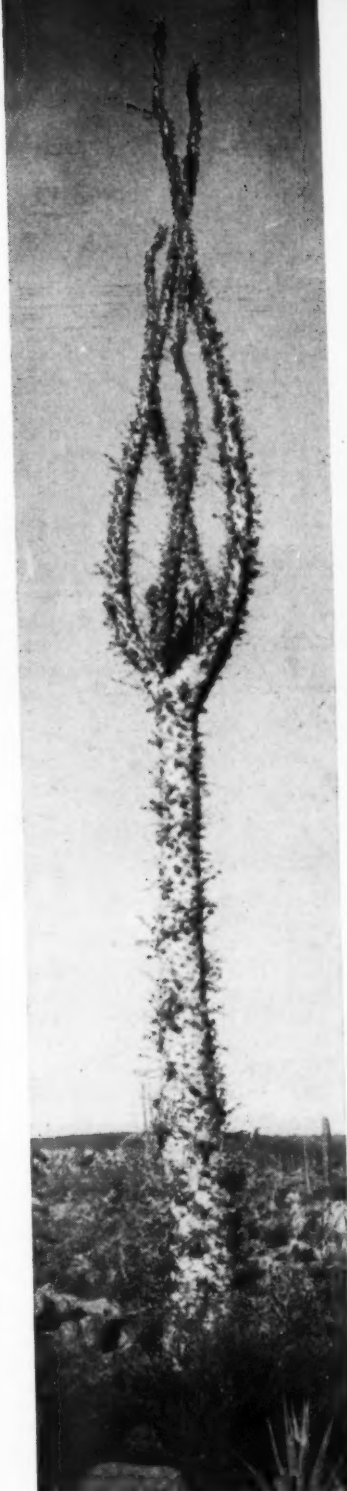
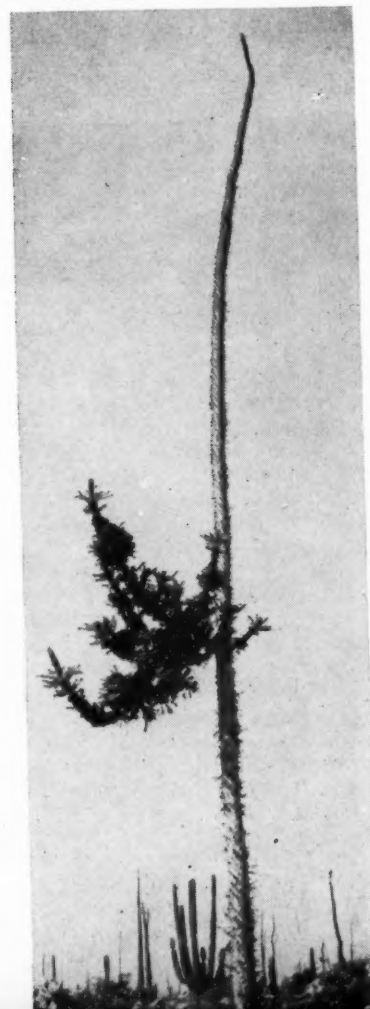
From a distance, the silhouetted trunks appear like a forest of leafless weeping willows. Closer inspection reveals hundreds of tiny fish-hooks emanating from the greenish birch tree-like bark.

The diameter of the long tapering trunk varies from three feet at the base to a few inches near the top. Except on rare occasions, the cirio,



Upon maturity, individual plants develop differently

Photos by Outdoor Photographers League



Cirios may reach height of 75 ft.

Plants are native to Viscaïno Desert, 200 miles below Mexico-U.S. border

which sometimes extends as high as 75 feet into the hot desert sky, is free from shoots until the tip is reached. From there every plant is on its own.

It is not peculiar that such an account has a familiar ring. In his fairy tale, *Alice in Wonderland*, Lewis Carroll's description of the boobum tree is surprisingly identical to that of the cirio.

Even with all its wicked thorns, which prevent woodpeckers from nesting in its trunk, the cirio is valued highly by the desert Indians as a sweet shop. With a machete, they cut out a square piece from the trunks of the older and larger cirios, where wild bees are known to swarm, and remove the honey. Then the cutout block is replaced so that the bees can continue to manufacture more honey for another raid.

There is a belief among the old-time prospectors in this region that wherever cirios grow in profusion, you will find gold clinging to their roots. There could be some truth in that adage, as some geologists call the desolate land of the cirios the richest undeveloped mineral belt in the world.

NO TIME ON HIS HANDS

By LESTER FOX

OLD professional foresters don't ever retire. They become tree farmers. At least that's what Arthur C. McIntyre did. Now he's applying the forestry advice that for many years he gave to others. He finds the work stimulating and the income useful in padding out his retirement pay.

For years Mr. McIntyre was woodland conservationist, U. S. Soil Conservation Service, for the 13 northeastern states. He retired from this work in 1958 after 28 years of federal service. Looking ahead to leisure, he had bought a 26-acre tract near Cochranville, Penna., in 1952, and stocked it with Christmas trees. The land was part of an old farm. The famous King Ranch bought the other part. When Mr. McIntyre withdrew from government service, he and Mrs. McIntyre took up residence on their tree farm. The place is situated in gently rolling country that affords a million dollar view from every window.

Mr. McIntyre has about 40,000 Christmas trees on his Triangle Tree Farm. Having started his woodland years before he retired, he was ready

to make his first harvest in 1959. That year he sold 2,500 trees to wholesalers for \$1.50 each, regardless of size, species, or grade. The buyers cut the trees and hauled them away. He sold the same number at the same price in 1960, and expects to do likewise this year. He sells perhaps a couple of hundred trees to individuals who stop by. For them he gets a higher price.

"I was amused by an incident that happened last Christmas season," Mr. McIntyre related. "I was amused, that is, after I got over the annoyance of being awakened by loud knocking on the door early in the morning. At the door was a driver for one of my wholesalers who said he had been ordered to pick up a truckload of Christmas trees about 20 inches high—none higher than 30 inches. It was just after a snow storm and the road was barely passable. He couldn't get into my plantation at all, but he said he would load the truck in the road, a long carry for trees. Then he told me another truck was following him to pick up another load of small

(Turn to page 53)



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1. Arthur C. McIntyre tags a Norway spruce tree, one of 2,500 Christmas trees that wholesalers harvested last year from his 26-acre plantation in Penna.
2. McIntyre inspects a full, nicely-shaped white pine Christmas tree. In the contoured rows, Norway spruce and Scotch pine grow to marketable size
3. Sale tag is checked on a white pine Christmas tree. On the left is a Scotch pine that has been tagged for harvest. McIntyre has owned tract since 1952
4. White pine is a tree species that is gaining increasing popularity with the Christmas tree buyers. Here, McIntyre tags a fine 8-year-old for harvest
5. McIntyre has about 40,000 Christmas trees on his farm. Having started his woodland years before retirement, his first harvest was ready in 1959
6. A prospective customer (left) examines a white pine tree being exhibited by McIntyre. The interested onlooker on right is Mrs. Arthur McIntyre
7. Besides his tree farming chores, McIntyre works hard at promoting good outdoor manners raccoon, Howdy, and editing "Pennsylvania Forests"

4.



5.

Canada Drives to

WHEN Lowell Besley left The American Forestry Association as its executive director, he left two monuments behind him. The first was his work in helping to spearhead the first Southern Forest Fire Conference. The second was his capable work in helping to engineer reform of the mining laws that today permits multiple use management on all mining claims on public lands.

Consequently, The American Forestry Association is keeping its eye peeled on the aggressive forester as

he spearheads a Canada-wide research program in his capacity as Chairman of Woodlands Research for the active Pulp and Paper Research Institute. There his task, in a word, is to carry on research that will show top management how to cut costs. It's a most challenging job.

"Trees are no problem in Canada and we certainly do not have any timber famine," Mr. Besley told AMERICAN FORESTS recently in New York City where he had come to address the annual meeting of

The American Pulpwood Association. "We have 700 billion cubic feet of merchantable timber in Canadian forests and an annual cut below three and a half billion.

"The big problem up here—the problem of the Canadian pulp and paper industry—is to reduce woods and transportation cost *per dollar of product*, not merely to reduce wood costs per unit of volume.

"To meet this broader goal, research must make—and is making—a systematic attack on the whole forest growing and harvesting operation," Mr. Besley stressed. "Ever increasing wages and ever expanding distances from pulp mills to unexploited stands of diminishing density must be offset by greater man-day production, more efficient transportation systems, and, eventually, by growing denser, more valuable stands closer to the mill, where both management and logging can be concentrated on smaller areas.

"Company management must make the economic decisions to choose between alternative methods and procedures," Mr. Besley pointed out. "It is the job of research to furnish the physical facts upon which these decisions should be based."

Among the many Canadian organizations engaged in woodlands research, the research center of the industry is the Pulp and Paper Research Institute of Canada which was set up in 1950 as a non-profit, tax-free, educational and research corporation, under federal charter.

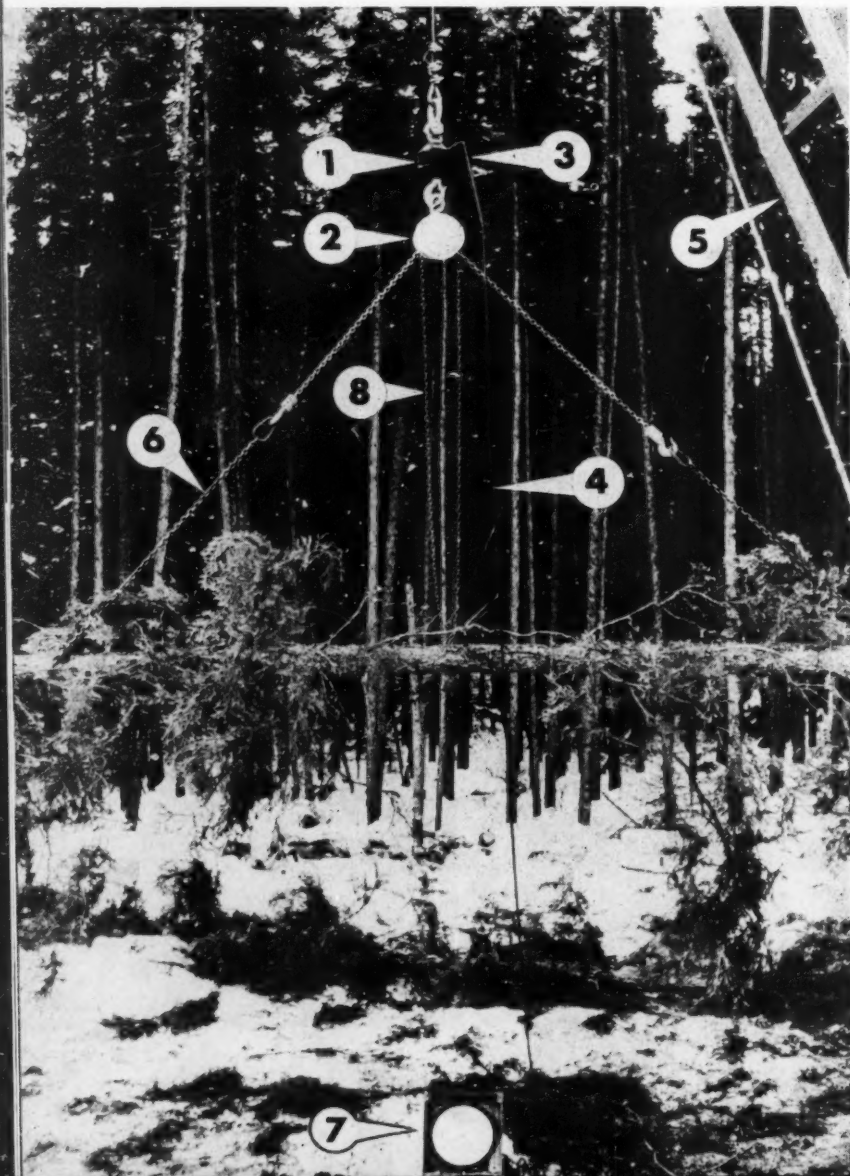
Mr. Besley stated the overall objectives of the Institute's woodlands research program as:

"1) To seek improved methods in

Equipment to determine weight and center of gravity of pulpwood size trees:

- (1) Hydraulic load cell (6,000 lbs. capacity)
- (2) Chain hoist modified for use as a levelling device
- (3) Arm used to keep hose clear of tree
- (4) Hydraulic hose
- (5) Crane boom
- (6) Sling chain
- (7) Pressure gauge (tare removable), calibrated to give direct reading of weight in pounds
- (8) Hand chain on hoist

AMERICAN FORESTS



to Cut Woods Costs

the logging and transportation of wood to mills;

"2) To find ways for ensuring an increasing supply of pulpwood of improved quality; and

"3) To assemble and distribute technical information relating to logging, engineering, and forestry matters.

"The current program in harvesting is concentrating on basic studies on the forces involved in logging operations in order to arrive at performance specifications for equipment. These forces apply to handling and processing trees, and transporting the pulpwood."

Traditionally, Canadian pulpwood has been cut into 4-foot bolts at the stump, and as late as 1957, only a sixth of the pulpwood was handled in tree lengths. This fitted in well with an ample supply of unskilled labor on a seasonal basis at reasonable cost. Today, however, Mr. Besley said, there is a trend towards year-round operation and mechanized wood handling with skilled operators. While there is an abun-

dance of data on weights of 4-foot wood, there is a serious lack of information on weights and centers of gravity of full trees and tree lengths.

"Consequently," he continued, "the Institute's first project in the series of 'Forces Involved in Logging' is concerned with the weights and centers of gravity of pulpwood trees. Eventually, we hope to end up with weight tables or charts for full trees and for their merchantable portions, similar to cubic foot volume tables now available. We also wish to find the comparative weights of the solid wood stem as compared with those of limbs, tops, and bark. And, lastly, we are interested in the piled volume of slash coming from trees of different sizes and diameters."

To obtain this information, Mr. Besley explained that trees are preselected and marked to get a satisfactory distribution of species and sizes. The tree is then felled and weighed. The center of gravity is marked and its distance from the butt measured.

Then, the tops, limbs, and bark



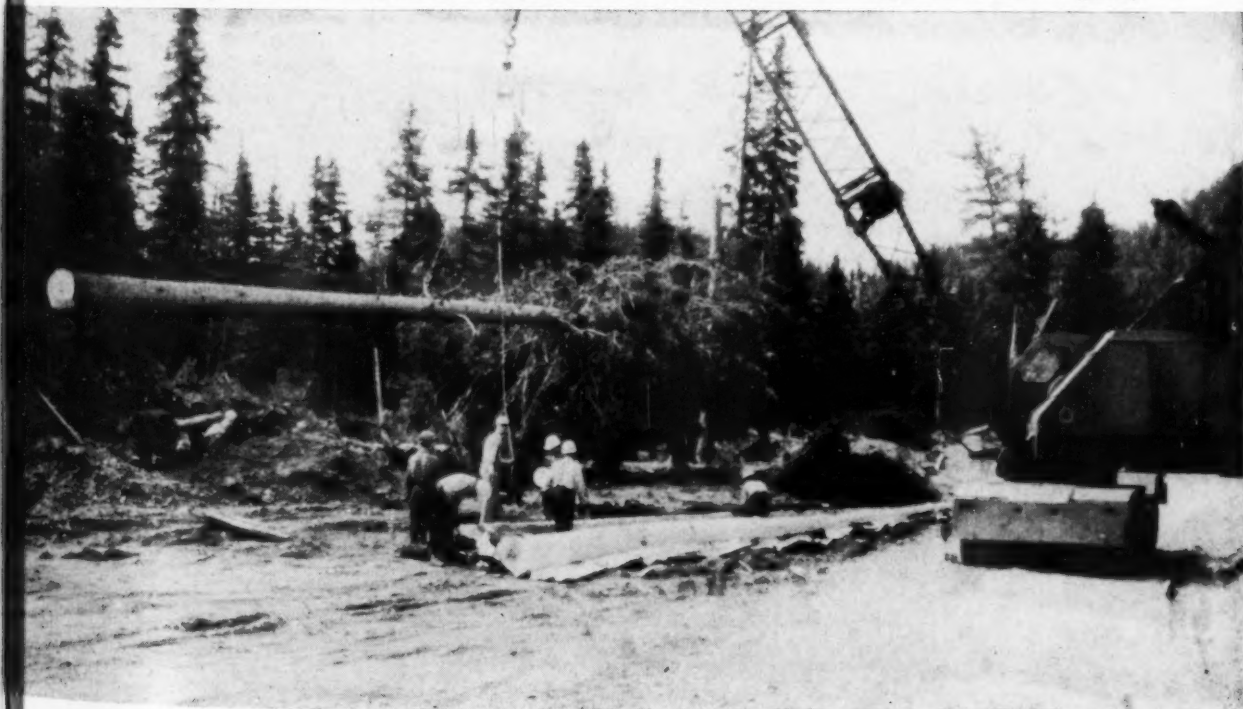
Lowell Besley, former executive director of AFA, is chairman of Woodlands Department of the Pulp and Paper Research Institute at Montreal, Canada

are removed, one at a time. After each cutting, the tree is again weighed and its center of gravity marked. The weight of each part removed is determined by subtraction.

Preliminary studies of 134 trees of white and black spruce and balsam fir have shown that full trees at 18 inches DBH (diameter breast high) weighed nearly 4,000 pounds, two-thirds of which was merchantable wood; those at 8 inches DBH weighed 570 pounds, only three-fifths merchantable; and those at 4 inches weighed 105 pounds, with only about

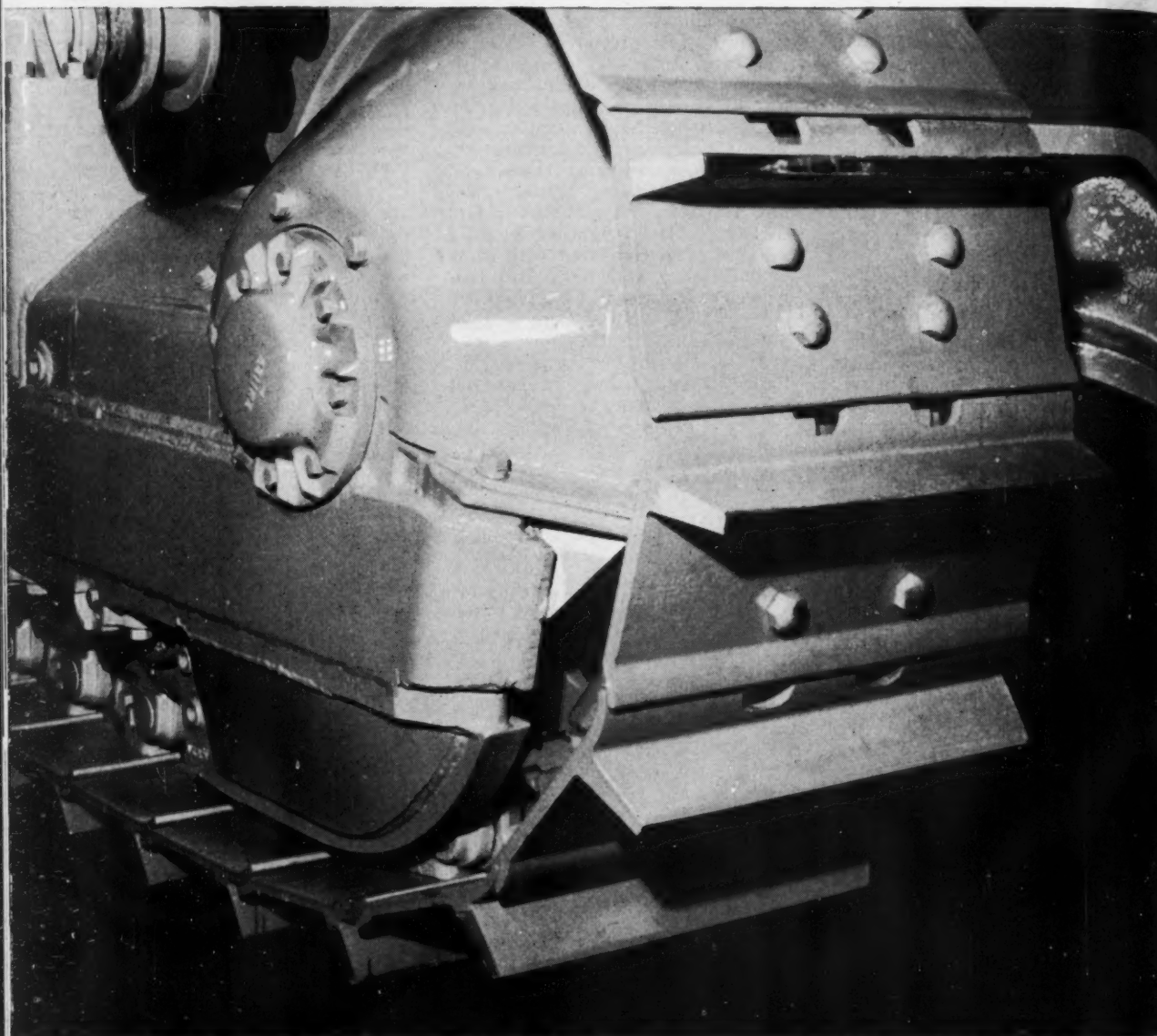
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One of the many projects being undertaken by the Institute is Forces Involved in Logging. Here a full white spruce tree is being lifted in preparation for determining its total weight and center of gravity





385 HP! FROM CATERPILLAR THE NEW D9G



MASSIVE HEAVY-DUTY UNDERCARRIAGE Immense strength and rigidity of undercarriage is one good solid reason why the D9G is more than equal to the roughest ripping job. Box section frame is wider and deeper than previous models. Hydraulic track adjusters are standard. Lifetime lubricated rollers with special alloy deep hardened rims assure long life... and they require no servicing until time to rebuild.

HIGH-PRODUCTION DOZER, PUSHER, RIPPER

For high-volume dozing, pushloading or ripping, the new D9G has what it takes... at minimum cost per yard!

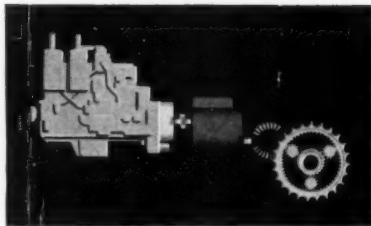
The engine in the new D9G delivers 385 flywheel horsepower. That's 100 more horsepower than the first D9 introduced five years ago!

Weight is 64,800 pounds—14% more than the first D9!

Torque divider power shift transmission... massive heavy-duty undercarriage... and power train with built-in ruggedness for long life.

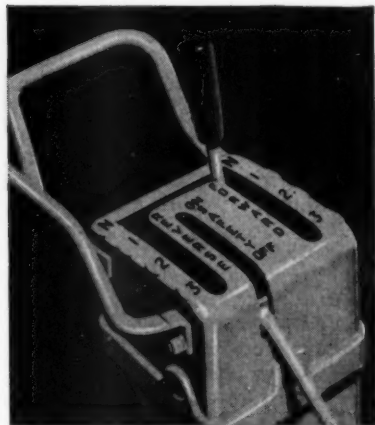
What else is new? Matching the D9G is a full line of attachments—all designed to help this new tractor really put out on the toughest big jobs.

CAT D353 ENGINE AND MATCHED POWER TRAIN This engine, rated 385 HP (flywheel) at 1330 RPM, has been proven—and proven again—over thousands of hours on the roughest jobs. Its 6.25" x 8" six-cylinder design now incorporates *controlled turbocharging* and aftercooling (found only in the D9G among crawler tractors), assures more efficient use of fuel, increases maximum torque and provides fast engine response over a wide range of operation. Shroud-mounted fan reduces air recirculation; torque limiting clutch saves on fan horse-



power. Plus: exclusive Caterpillar fuel injection system, twin dry-type air cleaners, oil-jet-cooled pistons, "Hi-Electro" hardened cylinder liners and crankshaft journals.

The new power train includes three major advances: *new oil-cooled steering clutches and brakes, new planetary final drives, and a time and cost saving common lube system.* The new spring-engaged, hydraulically-released steering clutches need no adjustments... have a proven longer service life. New, planetary final drives increase gear reduction ratios from 8.8:1 to 18:1, reducing torque load on all power train components. A common system cools and lubricates torque divider, transmission, bevel gear, steering clutches and brakes. This means one service point... one type of oil. The entire power train of the big new D9G has



unitized construction for fast, individual removal of components.

PROVEN TORQUE DIVIDER POWER SHIFT This exclusive Caterpillar design feature—standard equipment on the D9G—combines the efficiency and snap of direct drive with the load-matching and anti-stall characteristics of torque converter. A single lever gives the operator finger-tip control of his machine. It adds up to fast cycle times and greater efficiency. You get more out of the machine *all day*.

A FULL LINE OF HIGH-PRODUCTION ATTACHMENTS

New cable controls with larger clutch, brake and drum capacities—hydraulically boosted... new hydraulic controls in nine arrangements... special cushioned pushing equipment... angle, straight and U dozers, cable or hydraulic... rippers... scrapers... and others.

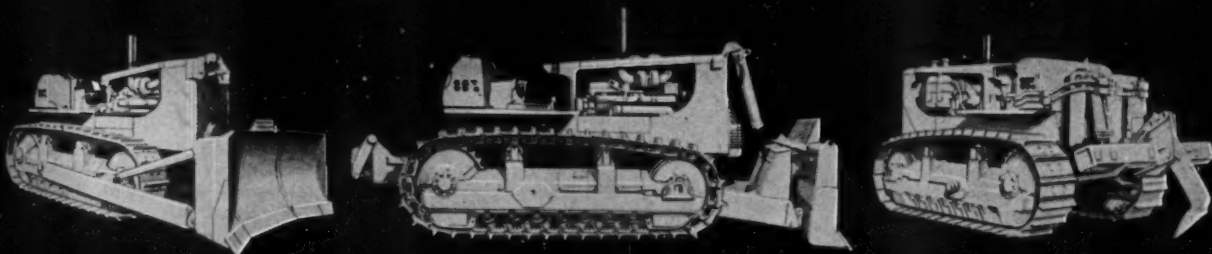
To prove the D9G's productive capabilities on your job, talk to your Caterpillar Dealer.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

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**NEW D9G—BIG,
POWERFUL, PRODUCTIVE**



ARIZONA'S JOSHUA

IT WAS night in the Arizona Joshua forest. The woodpeckers, wrens, and other birds had gone to bed and only the stars were left—or were they? From out of the shadows a white-footed mouse came stealthily to sniff the table scraps. Eying timidly the two humans and their camp, the small gray and white body tensed—were they friends or foes? Taking a risky chance, she gathered a few choice morsels and scooted away into the darkness. A gentle wind stirred the Joshua trees. They swayed for a moment and then settled to stillness, their great, shaggy arms uplifted against the sky as they had stood for hundreds of years.

Joshua trees are one of earth's oldest and strangest species of plant life. Fossil specimens date their ancestry back to the Pliocene Epoch two million years ago when little, three-toed horses sought shelter in their shade and giant sloths foraged their leaves for food. Today their only wild creature companions are the smaller animals and birds.

The trees received their name in 1851 from Elisha Hunt, head of a Mormon colony that had paused to rest near one of the West's Joshua forests. Clouds had drifted across the sun. The coolness of the great trees and their uplifted arms reminded

By IDA SMITH

them of Joshua, who commanded the sun to stand still.

Joshua forests are confined to the peculiar desert areas of Arizona, Utah, Nevada, and California. One of the largest is in California, northeast of Palm Springs. In 1936, this forest was set aside as the Joshua Tree National Monument. Not so well-known, however, are the fine Joshua forests of Arizona.

There are three of these interesting forests in Arizona: one in Mohave County north of Kingman; one in Yavapai County extending along Date Creek west of Congress Junction about twelve miles; and one in Yuma County near Ehrenberg.

The first written mention of the curious trees was in 1772, when Pedro Fages referred to them as date palms. Probably the name of Date Creek, Arizona, originated from a similar misunderstanding in the early days.

The Joshua tree is the largest of the yuccas, all of which belong to the lily family. The botanical name given to the Arizona Joshua is *Yucca* (Spanish) *brevifolia* (Latin for short-leaved) *Engelmann* (who named it in 1871). The Joshua is

the short-leaved yucca. It is said that Engelmann's description of the tree was taken from a Date Creek specimen.

One of the world's most curious partnerships exists between the Joshua trees and a little white moth. In early spring, from February to April, great clusters of pale greenish-yellow, bell-shaped flowers bloom on the Joshua trees. The heavy petals of the bells never open out as do most lilies, but have a tendency to hang closed. The only possible way in which they could be cross-pollinated would be by an outside agent other than the wind.

The agent is the little white moth, *Prunuba synthetica*; and therein lies a story that opens intriguing avenues of thought.

All through the spring nights *Prunuba* and her sister moths gather pollen from the Joshua blooms. Rolling it into pellets as large as can be handled, each moth carries her pollen to another flower and pushes it deep down into the blossom. Here the fertilized blossoms can now produce a pod of seeds. And here, deep down, the moth lays one egg. The process is repeated until she has laid her entire clutch of eggs in as many blossoms. The eggs are timed to hatch with the maturity of the seeds. *Prunuba's* baby caterpillars do not eat pollen. They feed on Joshua seeds. No other food will do. In return for the work of pollination, each caterpillar will eat a small portion of the seeds in its pod before it transforms into a chrysalis. Then as a moth, it flies away.

Apparently this partnership has been in operation since the Pliocene Epoch, during which the Joshuas' petrified wood left bits of its story in stone. Unless changes have occurred during those millennia, the dependence of the great, shaggy tree and the little white moth upon each other has been a requisite. Without the white moths, there would be no Joshua trees today; and without the Joshuas, there would be no *Prunuba* moths.

This bit of dramatic history is equaled in fascination only by the painstaking work of botanists and entomologists who spent nights on

These Joshua tree flowers are in full bloom. Flowers are a pale greenish yellow in color and have no fragrance. Each flower has six petals



FORESTS

the desert watching the *Prunuba* moths at work.

It is said that members of the Joshua family have been in their present locations for thousands of years. Petrified specimens, however, indicate that in ancient times they were much more widely distributed.

It is estimated that Joshua trees grow about an inch a year, and that a tree sixty feet tall would be between 700 and 800 years old. Age cannot be determined by tree rings as Joshua trees have no rings.

The Joshua tree has no deep taproot, but hundreds of smallish, round roots which depend upon moisture from showers. The trees do not bloom every year, but may skip a year or more, perhaps due to weather conditions. The leaves are fine-toothed and range from ten to twenty inches in length. When they die, they fold back on the branch, making a thatched covering like a hula skirt.

Several species of mice and wood rats nest in the Joshua leaves, and numerous species of birds build in the branches. Young shoots of the trees provide green forage for a variety of wildlife, and the surplus seeds furnish the staple food. One of the Joshuas' closest neighbors, rarely found elsewhere, is a little black night lizard, known as *Xantusia vigilis*, that lives under its bark and leaves and subsists on insects found there. *Xantusia* is harmless and his work beneficial.

The Date Creek Forest is well-known for its quartz crystal beds—great clusters of quartz crystals ranging from miniatures to two and three inches in length. The area has been prospected for other minerals, but apparently no others have been found. A colony of wild bees has taken over one of the diggings. Date Creek is one of the most popular hunting grounds for Arizona rockhounds, who can be found on many weekends digging crystals out of the hillsides.

Arizona's Joshua forests with their unusual landscapes, crystal finds, and small wildlife are among the state's unique attractions. A visit to these forests is like taking a fascinating journey into time.



A close-up of a Joshua tree bud at Date Creek

Joshua tree is beginning to bloom. Blooming season is usually February-April



Joshua tree bearing fruit. A cluster contains from 25 to 30 pods, Pods are 3" long





new mexico

SANTA FE, New Mexico, is a jewel of a city that quietly edges its way into the visitor's heart. If you liked Tucson, you will love Santa Fe. Flanked to the east by the towering Sangre de Cristo (Blood of Christ) Mountains and to the west, across the Rio Grande, by the Jemez Mountains, Santa Fe provides the setting for the 86th Annual Meeting of The American Forestry Association, October 1-4. Theme will be "The Stewardship of Our Public Lands."

Last month the writer made his first visit to what has truly been called the "Land of Enchantment." His guide was J. Morgan Smith, information and education officer for the Southwestern Region of the Forest Service who previously helped direct the "Smokey Bear" program. While basking in the warm sunshine, we leisurely made our way over the

route AFA members will follow this fall. After making this visit we are inclined to believe Santa Fe may prove to be the most outstanding meeting in the association's history. Let us attempt to tell you why.

Morgan and I first travelled to Santa Fe from Albuquerque and visited the delightful La Fonda Hotel, headquarters for our meeting. This deceptively huge and modern hotel is in the adobe-type architecture for which this region is famous. It offers high-ceilinged rooms with great timbered rafters and warm, lovely woodwork. The food is first rate and the desire of the friendly staff to make the visitor feel comfortable and at home is marked. There is no rush and bustle yet somehow things get done. The leisurely, courteous atmosphere of this hotel, and in fact the whole city, will present a welcome change to most of us.

The hotel fronts on a lovely plaza replete with cottonwoods, juniper, and other trees. From this vantage point we watched the Blood of Christ Mountains blush all shades of crimson and vermillion in one of the most gorgeous sunsets we have ever seen. At dusk, the quaint gas street lights on the plaza twinkle and flicker on the gorgeous costumes of the Navajo, Zuni, Hopi, and other Indians surrounded by their wares on the adjacent streets. The shops that ring that Plaza are picturesque, too. The ladies will love them. We bought our wife a "tear drop" bracelet to take home with us and she liked it. Diagonally across the Plaza from the hotel, (about 100 yards away), is the St. Francis Auditorium where our meetings will be held. This cathedral-like structure is one of the most beautiful we have ever seen. Its high-ceilinged loftiness



Photographs by New Mexico Development Dept. and U. S. Forest Service

(Left) Santa Fe's LaFonda Hotel, headquarters for the 86th Annual Meeting of AFA, October 1-4. Hotel combines charm with excellent food and good service. (Above) Camel Rock, near Santa Fe, shows strange result of wind erosion on soft stone

Land of Enchantment

certainly provides the spirit of uplift and idealism that should grace any meeting of conservationists. It is here that Gov. Edwin L. Mechem, of New Mexico, a real conservationist who founded the state's forestry program, will welcome the guests. He is going to describe this program for us in a future issue of AMERICAN FORESTS. The auditorium also has a splendid pipe organ and as we strolled on the Plaza one evening its lovely music came drifting through the trees. It was then we decided that what has truly been called the "Land of Enchantment" is also a land of music.

New Mexico presents six life zones to the visitor and we are going to visit them all. Our first opportunity to see them will come early in the program when we visit the Snow Bowl in the nearby Santa Fe National Forest. In addition to providing

a wide gamut of resources for the area, this forest is also the playground of the region. We will make this visit via the ski lift and the day Morgan and I went we saw a bobcat, a number of roadrunners, deer, and a variety of birds. The zones include the Lower Sonoran, area of the mesquite, creosote bush, Spanish bayonet, screwbean, desert willow, and valley cottonwood. The Upper Sonoran, largest of the zones, embraces the grazing lands with gama, galleta, buffalo and porcupine grasses—where they haven't been depleted. The timber wealth comes from the Transition Zone which is the next up and this is the reservoir for New Mexico's water. We found Bristlecone pine, western white pine, balsam, and Douglasfir. We also found steep banks of snow on both sides of us and finally had to turn around and drive out or get stuck. This was

in late April. The Hudsonian is a very narrow zone on the upper slopes of the high mountains and presents Siberian juniper, Engelmann spruce and a few others. Highest of all at 12,500 feet and up is the Arctic-Alpine zone. This area is above timber line. There are no trees and few animals. Plants include Colorado poppy, several species of saxifrages, sedges and rushes and closed gentian, alpine larkspur and alpine sagebrush.

Incidentally, October is a fine time for tree lovers to visit New Mexico; forest and parks officials promise the lovely aspens will be at their shimmering best.

One of the highpoints of our visit will be a visit to Bandelier National Monument presenting the Pueblo Indian ruins in the Frijoles Canyon. We are going to have a picnic lunch at the beautiful Bandelier Picnic

Area and the National Park Service, Bureau of Indian Affairs and Atomic Energy Commission (yes, we will also visit Los Alamos), will be in charge. We are also scheduled to visit a number of the Indian Pueblos and are slated to see some Indian dancing. Incidentally, these Indians are some of the best fire fighters in the world. They are hardy, of course, but there is more to it than that. Forest Service officials, who have a healthy respect for well-disciplined people themselves, say one reason is the fact that Indian boys are disciplined from birth and learn early how to work as a team.

Another spectacular day will be the visit to the immense Charma Valley. Here we saw land that has been brutally overgrazed and it is a sight to sadden any lover of good land management. One attempted answer, which we will visit as the guests of Army Engineers, is Abiquiu Dam. At the moment, this is one of the biggest holes in the ground we have ever seen. Presumably it will provide 562,000 acre feet of water storage capacity (an acre foot equals one acre of water one foot deep or 325,850 gallons). It is also being designed to protect the middle and lower Rio Grande Valleys from flood waters. It doesn't rain very often in New Mexico (only 7 to 8 inches of rain a year in less fortunate areas), but when it does descend, it comes down in torrents.

Some land managers say this dam presents no answer at all to the prob-

lem or at least only a partial answer and that the dam will be one big silt catcher. No one can visit any state for a couple days, of course, and pretend to be an expert on water, grazing or anything else. We do not pretend to be. But people there with conflicting points of view say the big drive must be made on land treatment itself. And members who visit New Mexico will have an opportunity to see this point of view brilliantly presented at the new Ghost Ranch Museum, a pioneer outdoor interpretive project directed by William H. Carr, vice president of the Charles Lathrop Pack Forestry Foundation.

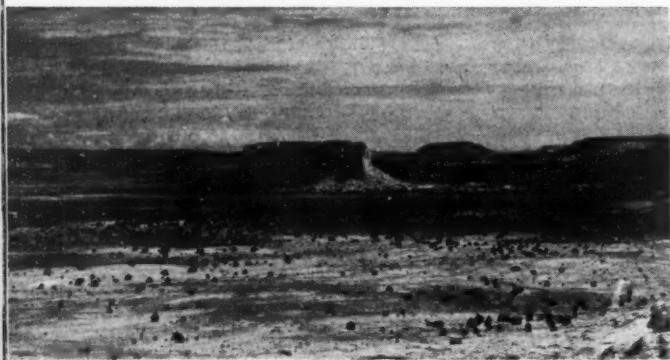
Members who visited the Arizona-Sonora Desert Museum in Tucson also created by Mr. Carr will be looking forward to the New Mexico version with keen anticipation and they won't be disappointed. Mr. Carr says, "We built this museum in this untenated but well-visited region to inform the people of their own country of its vanishing wildlife, grass, water, and soil and its wonders of life, past and present, and rehabilitation possibilities for the land in the future."

Mr. Carr, who will describe this work in detail in a future issue of *AMERICAN FORESTS*, has done just that. While many interesting animals, birds, and reptiles are presented, the hero is the original upstream engineer himself, Mr. Beaver. Located in close proximity to the big Abiquiu Dam, this exhibit might

be labeled "Beavers vs. Big Dams" and Mr. Carr's money is on the beavers. In his exhibit, Mr. Carr not only shows the land the way it was and is but also the way it can be again if man will adopt prudent methods. The day Morgan and I were there Bill Bergoffen, of the Forest Service, was on his way to put the finishing touches on an elaborate multiple use exhibit by the Forest Service that will be dedicated by Chief McArdle, of the Service, at our meeting. This promises to be the *pièce de résistance* in a long line of such exhibits with the Bergoffen touch. Stereo sound yet, if Bill gets his way, living trees from the various life zones, and a miniature river with running water from reservoirs hundreds of feet down in the earth!

A number of members have indicated they want to see examples of both good and bad grazing and want the facts on these problems. We will begin to dig into these things on the trip up the Charma Valley and the effort will be continued on a trip to the Rio Puerco area as hosted by the Bureau of Land Management and the Forest Service Experiment Station. We should bear in mind, of course, that grazing is a big industry in this region. And not all grazing is wasteful by any means. While some ranchers still cling to the old methods and are depleting their land, others are working closely with government agencies and are doing many worthwhile things in a land that is notoriously dry with

New Mexico's enchanted mesa—wrapped in a shroud of legend and steeped in antiquity—is still home of the Acoma Indians



Scene of many an AFA Trail Ride, Pecos Wilderness country presents snow-capped peaks, good fishing, and game animal



Visits to Indian Pueblos will be a special feature of the AFA trip to the Land of Enchantment

very little precipitation. With men like Regional Forester Fred K. Kennedy and C. A. Merker directing the program, we can rest assured we will be given a true and balanced picture. Two other famous Southwesterners, Secretary of the Interior Stewart L. Udall and Senator Clinton P. Anderson will bring conservation messages to the membership. Thus we will have the state, regional, and national picture.

New Mexicans are very recreation-conscious one also learned on this brief trip. One can easily see why. The climate is warm and invigorating. The scenery is superb. The land is rich in history. New Mexico is a land of vast wilderness fastnesses like the Gila and the Pecos, it offers superb hunting and fishing opportunities. Men like the historian, George Fitzpatrick, the able editor of *New Mexico*, are fully cognizant of these facts. When we were there in April, Mr. Tucker, of the Development Program, was finalizing plans for a special train to tour over the country with state officials who will attempt to bring new industries and visitors to the state.

After one brief visit to the "Land of Enchantment," we know you will love New Mexico. And among other things this is the state where "Smokey Bear" was born—up on the Lincoln National Forest. We hope you will be on deck with us come October to hit the old Santa Fe Trail. *Buenos dias, amigos.* (J.B.C.)

Natural auditorium worn out of solid rock is feature near Ghost Ranch Museum outside of Abiquiu, N. M.



Golf course in big timber country at 9000 feet is feature of Lincoln National Forest at Cloudcroft, New Mexico

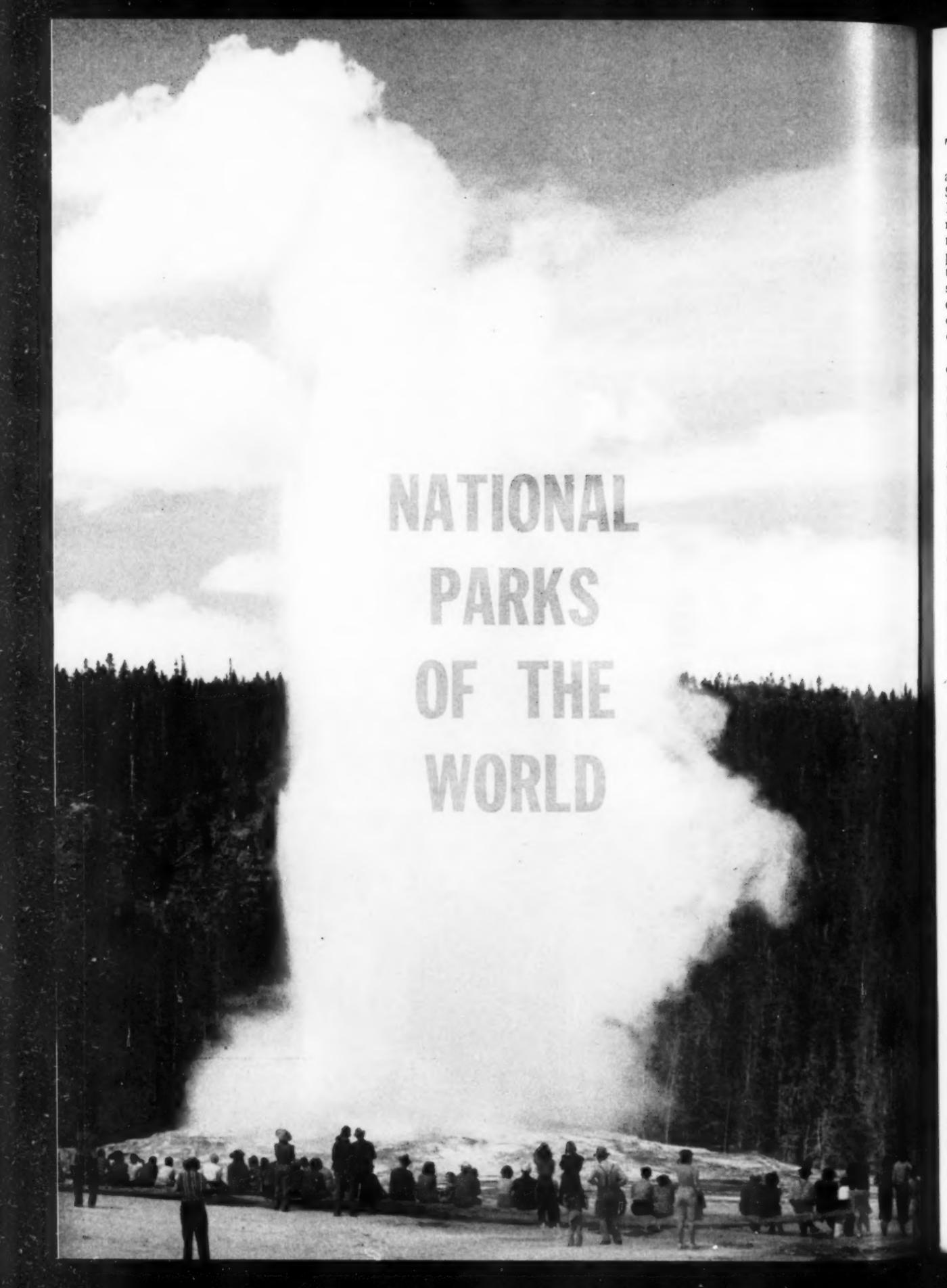


Sacred to the Indians, mighty Shiprock towers 1,640 feet above the plains in New Mexico's Navajo Indian Reservation



"Tent Rocks" are strange formations due to wind-erosion on volcanic rock

AFA members will ride chair lift to 12,000 foot summit at the Santa Fe Ski Basin



**NATIONAL
PARKS
OF THE
WORLD**

THIS year more than 70 million people will visit the numerous areas of the U. S. National Park System, including approximately 180 national parks, national monuments, national historic sites, and related areas of various types. These people will not only have fun, but they will be enriched by contact with some of the finest and most significant examples of the geology, biology, archeology, and history of our country.

Such experiences, shared by a constantly increasing number of Americans, are the legacy left to us by such pioneers in this field as Olmsted, Langford, Washburn, Muir, Hedges, and Mather, as well as a host of others who aided in the awakening of interest in the need for preservation of such national treasures, or who have initiated ways and means required for public appreciation and understanding of the significance of such lands. It is becoming increasingly recognized that a visit to any area in the U. S. National Park System returns far greater benefits than those inherent in a pleasant camping trip, a spectacular drive through dramatic scenic country, or an opportunity to tone one's muscles on a hike, fill one's lungs with fresh, untainted air, or free one's self from the tensions of modern living. True, such values are important in their own right and they are logical and proper derivatives of a visit to any one of these areas. However, such visits become doubly meaningful when related to the cultural opportunities inherent in one's understanding of events that were responsible for the scenic magnificence, archeological characteristics, or historical relationships presented by such areas as Sequoia, Grand Canyon, Carlsbad Caverns, or Mesa Verde National Parks, Fort Laramie, Death Valley, or Tuzigoot National Monuments, or Gettysburg National Military Park.

Because of the wide acceptance of the national park principle of land use in the United States and the growing recognition that these areas offer a recreational experience quite different from other vacation lands, it is not difficult to understand why people in many foreign lands have also recognized similar values in their own corners of the world. Over fifty nations, representative of every continent, have established national

By C. FRANK BROCKMAN

parks, wildlife refuges or sanctuaries, preserves, and lands of similar type for the preservation of the natural scene, or have placed sites of historical or archeological importance under public supervision and control to insure the continued maintenance of these specific interests for all time.

This philosophy of land use, first manifest in the United States with the establishment of the Yosemite Grant in 1864 and the formation of Yellowstone National Park in 1872, has become international in scope within the past decade. It has developed in various countries of the world in spite of great differences in population densities, wide variations in heritage or background, obvious dissimilar economic situations, the history of past land use, or the nature of political ideologies.

It typifies the common goal in man's search for truth and understanding. It is representative of the inherent acceptance by people throughout the world, regardless of ethnic origin, geographical location, or economic status, of principles which seek to preserve representative unique examples of the interests of one's homeland for the enjoyment and understanding of future generations. In a sense, it is a symbol of a universal language of understanding not unlike that which typifies man's interest in good music, inspiring literature, and great art.

National parks and related areas in foreign countries naturally have a wide range of interests. By comparison with more familiar characteristics typical of such areas in the United States, such as Yosemite, Yellowstone, or Crater Lake National Parks, many are highly exotic in character. They run the gamut from tropical forests to frigid arctic wastes, from thunderous cataracts to the quiet beauty of limpid lakes, from far-flung vistas of expansive plains to the delicate beauty of meadow, moor, and mountain valley; and from stark, rigorous alpine terrain to seascapes. Each of these situations possesses typical plant and animal associations, or exhibit particular imprints of the culture and activities of prehistoric or even con-

temporary man. These areas include such noteworthy interests as widely diversified animal life, typified by the justly famous faunal parks and reserves of Africa; others embrace equally diverse botanical interests, ranging from the steppes of the USSR, the tropical jungles of Indonesia, and the parched plains of Mexico, to the frigid slopes of some of the world's greatest mountains and mountain ranges. Archeological and historical interests are likewise included, as at the site of the Althing in Iceland, the historic Robert Bruce country in southern Scotland, and at Gedi and Olorgesallie National Parks in Africa. In short, these foreign areas are worthy associates of similar areas in the United States.

What is the history and background of international interest in this form of land use? Obviously, it did not develop simply by accident. Like related manifestations in the United States, it has been characterized by much trial and error, by many problems and much controversy, and typified by varying degrees of public apathy, indifference, and even resistance. As in the United States, the growth of the national park idea in foreign lands was prompted largely by the activities of far-sighted individuals or organizations who were not adverse to advancing their principles and who had the ability and fortitude to overcome most of whatever obstacles were encountered.

Initial action along this line took place in Canada only 13 years after the establishment of Yellowstone National Park. At that time, 1885, an area of 10 square miles surrounding the hot springs at Banff in the Province of Alberta was designated as a health resort. Two years later this area was enlarged to 260 square miles and christened Rocky Mountains, later Banff, National Park. This Canadian area, the second unit of land in the world to be specifically designated as a national park, was the nucleus of the present superb Canadian National Park System. However, although Banff was the first tangible expression of the national park idea in a foreign land, the groundswell of the national park idea began to develop at an earlier period in widely scattered parts of the world.

In Africa, attempts were made to prohibit the ruthless slaughter of

native wildlife in Transvaal, now a part of the Union of South Africa, as early as 1846, but the earliest tangible manifestation of such interest on that continent did not develop until 1877 when the Hluhluwe Game Reserve was established in Natal. This area is still regarded as one of the outstanding

areas of its type in the world. Later areas of a somewhat similar category were established in other portions of Africa. In 1889, King Leopold of Belgium set aside a small reserve in the Belgian Congo, primarily for the protection of elephants, and the Sabie Game Reserve in Transvaal, forerunner of Kruger

National Park, was established in 1898.

Parks and reserves of the Republic of Indonesia, although dating from 1912 during the period of Dutch sovereignty, might be said to have grown from expanding sentiment in that direction as first expressed by the reservation of a sec-

National Parks of the World

Country	No.	Aggregate Area (Acres)
NORTH AMERICA		
Canada	18	18,754,000
Dominican Republic (several small areas)		
Guatemala (several small areas)		
Honduras	2	
Mexico	50	2,500,000
United States	29	13,553,000
SOUTH AMERICA		
Argentina	8	6,261,000
Brazil	4	597,000
Chile	10 or 12	75,000 (approx.)
Peru	1	
Venezuela	5	700,000
AFRICA		
Algeria	14	70,000
Belgian Congo	4	7,432,000
Ethiopia (Mengasha Forest is considered as a park)		
French Cameroons (12 game preserves)		
French Equatorial Africa	5	4,522,000
French West Africa	2	2,500,000
French Somiland	2	25,000
Kenya	6	5,484,000
Madagascar (12 natural reserves)		
Morocco	2	85,000
Mozambique	1	
Federation of Rhodesia & Nyasaland	10	3,900,000
Sudan	2	
Tanganyika	1	3,584,000
Tunisia	1	12,000
Uganda	2	1,280,000
Union of South Africa		
Cape Province	3	2,342,000
Natal	2	21,000
Transvaal	2	7,456,000

Country	No.	Aggregate Area (Acres)
ASIA		
Burma (12 game sanctuaries)		
India	1	128,000
Indonesia (about 104 nature reserves and 12 nature parks)		
Japan	19	4,360,000
Lebanon	1	
Federation of Malaya	1	1,073,000
New Caledonia	1	
Philippine Republic	39	599,000
AUSTRALIA & NEW ZEALAND		
New South Wales	42	1,580,000
Queensland	Over 200	800,000
South Australia	1	2,000
Tasmania	8	500,000
Victoria	16	313,000
Western Australia	3	18,000
New Zealand	8	3,893,000
EUROPE		
Belgium	5	470
Finland	2	212,000
France (several special reserves)		
Great Britain	10	3,354,000
Greece	3	
Iceland	1	
Italy	4	458,000
Poland	8 to 10	175,000 to 200,000
Soviet Union (40 preserves of approximately 4,000,000 acres)		
Spain	2	
Sweden	15	977,000
Switzerland	1	39,000
Yugoslavia	18	429,000

tion of the primeval jungle forest on the slopes of Mount Tjibodas on the island of Java in 1889. The specific purpose of that area was primarily that of a natural laboratory for scientific research; it was placed under the protection of the Botanical Institute of Buitenzorg.

The most outstanding park system among Asiatic nations is found in Japan. The first Japanese national parks were established in 1934; however, such action was originally promulgated toward the end of the last century by Nagaroni Okabe, a member of the House of Peers, who had developed a great interest in Yellowstone National Park during an earlier period of study in the United States.

In Europe, although laws relative to natural resource conservation were put into effect at a very early date, the idea of conservation with scientific, aesthetic, cultural, or social

objectives did not materialize until 1909. The first European national parks were established in Sweden in that year.

Some other important milestones of the national park movement in Europe also deserve mention. In 1880, a Finnish scientist proposed that certain natural areas still in existence in Europe be permanently reserved for posterity. Four years later James Bryce introduced his Access to the Mountains Bill into the British House of Commons; this bill sought to preserve public rights to "open country" in Scotland. Neither of these efforts were successful. Finnish national parks are based upon the Nature Protection Act of 1923 and the first national parks in Great Britain did not come into being until 1949 when the National Parks and Access to the Countryside Act was passed.

Tongariro, the first area in New Zealand's national park system, was

established in 1894, but two years earlier, by authority of the Land Act of 1892, a vast coastal section on South Island was reserved. This area was later incorporated into the New Zealand system as Fiordland National Park. A number of areas in various Australian states were also established previous to 1900. Certain lands in New South Wales owe their origin largely to the Public Trusts Act of 1897, and in Western Australia lands of similar category are largely based upon the Parks and Reserves Act, 1885-1897. Although little known and still largely undeveloped the Republic of Mexico has a national park system of nearly 50 areas with an aggregate area of about 2.5 million acres. While all but two of these have been established since 1935, El Chico, a scenic forested area of about 4500 acres in the state of Hidalgo, dates from 1898.

(Turn to page 51)

National Parks of the World Over 1,000,000 Acres in Size

Area	Country	Acreage
Wood Buffalo National Park	Canada	11,072,000
Tsavo National Park	Kenya	5,164,160
Kruger National Park	Union of South Africa	5,120,000
Serengeti National Park	Tanganyika	3,584,000
Wankie National Park	Federation of Rhodesia and Nyasaland	3,365,000
Fiordland National Park	New Zealand	2,959,793
Parc National de l'Upemba	Belgian Congo	2,932,000
Katmai National Monument	United States (Alaska)	2,697,590
Jasper National Park	Canada	2,688,000
Parc National Albert	Belgian Congo	2,500,000
Bamingui-Bangoran National Park	French Equatorial Africa	2,471,000
Kalahari Gemsbuck National Park	Union of South Africa	2,336,000
Glacier Bay National Monument	United States (Alaska)	2,274,595
Yellowstone National Park	United States	2,221,772
Nahuel Huapi National Park	Argentina	1,950,000
Mount McKinley National Park	United States (Alaska)	1,939,493
Death Valley National Monument	United States	1,907,760
Banff National Park	Canada	1,640,960
Kosciusko State Park	New South Wales, Australia	1,500,000
Everglades National Park	United States	1,499,428
Los Glaciares National Park	Argentina	1,482,000
Parc National de la Garamba	Belgian Congo	1,250,000
Bredasdorp Bontebok National Park	Union of South Africa	1,152,000
King George V National Park	Federation of Malaya	1,113,280
Odzala National Park	French Equatorial Africa	1,111,950
Glacier National Park	United States	1,013,129

Recreation Trends in the South

By KENNETH B. POMEROY

A REVIEW of current trends in outdoor recreation in the South indicates that hunters, fishermen and other recreationists can exert considerable influence upon the future of southern forestry. In summary, their impacts are:

1. Sportsmen, through their influence upon public opinion, can force modification of timber management practices on industrial and public forests.

2. Many hunters and fishermen are farmers who enjoy their sport upon their own property. Showing them how to improve wildlife habitat through better forestry practices could be a way to increase the production of merchantable timber.

3. Private clubs and many individuals are acquiring forested areas for recreational purposes. On such tracts, timber production may be of secondary importance to the owners.

4. Public agencies will acquire substantial acreages for waterfowl and game refuges. Although much of this will be in non-commercial marshes and swamps, timber production on the upland soils will become secondary to game management.

5. The land now in public ownership will be utilized more and more intensively by succeeding generations of recreationists.

6. It is unlikely that any substantial acreage of commercial forest land will be added to southern national forests or national parks for recreation purposes.

7. In time, state, county, and municipal park systems may be enlarged

as much as ten times their present acreage. The twelve southern states now contain 623,301 acres in such classifications.

For convenience, discussion of these impacts has been divided into two classifications—those of sportsmen, who take their trophies where they find them, and other recreationists, many of whom gravitate toward the improved portions of public lands.

Hunters and fishermen long have been recognized as potent framers of public opinion. In the South they are the primary recreation users of private forest land. In 1959, 3,444,801 people held hunting licenses and 5,622,588 had fishing licenses in the southern states. About ten per cent of these people belong to sportsmen's clubs. It is this small fraction that sways public opinion.

Southern foresters received a first hand demonstration of the power of sportsmen only a year or so ago. Then hunters began to belabor timber-minded people with hot editorials. The protests focused on the controlling of hardwood trees in order to make room for pines, particularly the felling of unmerchantable den trees and the girdling of sprawling mast and nut trees. After squirming uncomfortably for a time, industrial and public foresters managed to turn off the heat by modifying cultural practices on the lands for which they were responsible. Together these

two groups direct the timber management work on one-quarter of the commercial forest land in the South (industrial 17%, federal 7%, state 1%). Probably the actual reduction in growth of timber as a result of this modification will not be great. But the incident is cited to indicate who calls the time and who dances the jig.

Sportsmen tend to concentrate their attentions on the common species of wildlife. A 1950 survey in North Carolina revealed that rabbits, squirrels, and quail made up 72 per cent of the undressed weight of wild game killed by licensed hunters. However, there were four unlicensed hunters for every six with licenses. The others did not need licenses because they hunted on their own land or were under 16 years of age.

Among licensed fishermen 60 per cent of those questioned expressed a preference for bass or pan fish. But only 23 per cent of those who fished purchased licenses. Three quarters of all the fishermen used live bait in their home counties or engaged in coastal fishing where licenses were not required.

The above statistics indicate that much of the hunting and fishing is done by local residents who seek to put meat on the table at a reasonable cost. For this purpose farm lands and farm ponds are used to a large extent by resident hunters or fishermen. The importance of such use is indicated by the fact that farm woodlands make up about one half of all the commercial forest land in the South.

Probably the hunting and fishing of local residents has little effect upon the growth of timber in farm woodlands. Much of this land is in a low state of productivity anyway. But one way in which to improve the yield of timber might be to arouse the interest of the hunters by showing them how better forest management would improve their sport.

The extent to which farm woodlands are open to the public for recreation of any type is unknown. A current survey of The American Forestry Association in North Carolina will yield an estimate next year.

Most of the timberlands managed

(Turn to page 46)

Areas controlled by State Fish and Game Agencies.

State	Owned in Fee Acres	Leased Acres	Under Co-Op. Agreements	
			Private Land Acres	Public Land Acres
Alabama	21,744	-----	234,284	238,100
Arkansas	200,000	9,000	150,000	117,500
Florida	112,000	-----	1,404,300	1,996,267
Georgia	-----	-----	135,000	300,000
North Carolina	177,906	27,599	87,626	800,445
South Carolina	14,110	-----	93,000	150,550
Tennessee	115,727	499,459	62,000	437,459
Virginia	64,000	-----	48,400	1,723,000
Texas	146,416	27,882	51,125	190,397
Forested region of East Texas	(11,197)	-----	(46,771)	(86,676)

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Recreation Trends in the South

(From page 44)

by forest industries are open to the public. A recent survey by The American Forest Products Industries, Inc., revealed that hunting is permitted on 92.3 per cent of the company lands, while fishermen may enter 97.4 per cent of the land. The survey encompassed 86 per cent of the industrial forest land in the nation.

About one-quarter of the southern woodlands are held by people who are neither farmers nor industrialists. Much of the property is held for recreational purposes. In a survey of its members two years ago, The American Forestry Association discovered that 50 per cent of those answering the questionnaire listed recreation as one of the primary reasons why they owned forest land.

Some people own woodland as a place to retreat from life's daily frustrations. Others commercialize their recreation. One man bought 5,000 acres near Southern Pines, North Carolina, so that his friends could "ride to hounds" with him. He maintains a stable of 47 fine saddle horses and each ride is a gala social event. This project is a business venture. Its present success does not indicate any need to depend upon timber for future income.

A more familiar sport is the bird shooting favored on private estates. A survey several years ago indicated that more than 500,000 acres in North Carolina were in private game preserves. This is about one and one half per cent of the total land area of the state. Presumably much of it is forested.

Sportsmen's clubs frequently lease substantial acreages of private land. Last year the East Texas Wildlife Association leased 70,000 acres for wildlife management purposes. Of this land, about 12,000 acres belongs to the Kirby Lumber Company. Apparently the arrangements are satisfactory for the Sportsmen's Club of Texas is studying the possibilities for game management on 11,000,000 acres in other ownerships. Similar surveys are in progress in other states.

Waterfowl experts say that at least 7,500,000 acres of marsh, swamp, and water should be acquired in the United States with public funds for nesting, resting, and feeding grounds for ducks and geese. They hope that 4,500,000 acres could

be acquired by the federal government and the remainder by the states. With the exception of the bottomland hardwood types in the lower Mississippi Valley, most of this land would be non-commercial forest. The major acquisitions in the South would be along the Atlantic flyway in the southeastern states.

The federal government is financing its share of this program with money received from the sale of Duck Stamps. During fiscal year 1960, the first under the present \$3.00 rate, 1,628,385 hunters paid in \$4,885,095. The result was about 25 per cent below expectations because of a sharp decline in the duck population as a result of drought conditions in the nesting regions. When conditions improve, at least \$6,000,000 should be available for acquisition of waterfowl refuges.

Additional funds for game and fish restoration are derived from excise taxes on sporting goods. In 1937, the Pittman-Robertson Act imposed an 11 per cent tax on arms and ammunition. The Dingell-Johnson Act of 1950 placed a 10 per cent tax on fishing rods, reels, creels, and artificial lures. Both of these acts provide that funds will be made available for cooperative projects on a 75 per cent federal-25 per cent state basis. The allocations are made under equations that weigh the area of each state and the number of license holders for each sport.

From these two sources the twelve southern states have been allotted \$4,752,810 for fiscal year 1961. A total of 711,662 acres have been acquired under these two programs since their origin.

Matching money for land acquisition by state wildlife agencies usually is derived from license fees paid by hunters and fishermen. For example, the fish and game laws of North Carolina provide that twenty-five cents (25¢) of each license fee "shall be set aside as a special fund which shall be expended by the North Carolina Wildlife Resources Commission, in its discretion, for the purpose of purchase, lease, development, and management of lands and water. . . ." (General Statutes 113-95).

The total area under control of state fish and game agencies is not known. Nine of the southern states have reported as shown in Table 1. All of them are permitted to use a

portion of the license fees for land acquisition, but most of the money is expended for administration and protection activities.

The important fact to bear in mind is that *licensed sportsmen are paying for their pleasure through self-imposed fees and special taxes.* They are only partially dependent upon appropriated funds, mainly for the operation of federal refuges. Therefore, the money available for acquisition will be in direct proportion to the numbers of hunters and fishermen. There were about 25 million sportsmen in 1955. By 1975 there may be 68 million, according to the United States Fish and Wildlife Service.

Space for sportsmen might be provided by making recreation another cash crop from private land. In an address before the American Farm Bureau Federation, Francis W. Sargent, executive director of the Outdoor Recreation Resources Review Commission, said:

"It seems clear that private lands must play an increasingly important role in the nation's outdoor recreation picture. If we are to urge that private lands be made an effective and widespread part of our national recreation resource, we must also put forward a plan for fairly compensating the landowner or at least protecting him from property loss or a lawsuit for injuries suffered on his land."

He then went on to say that the compensation might be provided by remitting a portion of the license fees to the landowners.

Last summer I explored this idea with 160 people chosen at random during visits to state and federal camping grounds in North Carolina. The question was phrased in this manner:

"Inasmuch as game and fish are the property of the state, do you think private landowners who permit the public to hunt and fish on their land should receive a tax rebate or other concession from the state?"

The responses were about 3 to 1 against the proposal. There was no significant difference in the attitudes of urban versus rural residents or of landowners versus non-owners. One sportsman flatly stated:

"The urban resident who complains about not being permitted to hunt on private property is at heart

a 'free loader' and very likely a game hog. I belong to two hunt clubs and consider it a privilege. We have strict rules of sportsmanship and anyone violating them is immediately expelled from membership."

If this man's attitude is a fair sample of his club members, then I should think their activities would be helpful to forestry in general.

Mr. Sargent, in his ORRRC address, also spoke of protecting the property owner. This idea already has been developed by the West Tennessee Sportsman's Association. It provides insurance which guarantees the good conduct of its members and up to \$100 for any damage that might be caused. Each member of the association is required to secure permission to hunt from the landowner and then give him a card which outlines the details of the insurance contract.

Campers, picnickers, hikers, and other outdoor-minded people have placed tremendous pressure on public recreation facilities since World War II. All indications point to a continuation of their pyramiding demands. The United States Forest Service, national host to 81½ million visitors in 1959, expects to be deluged with 600 million visits annually by the year 2000. Many of these people will converge upon the southern national forests, especially those in the mountains. What the Forest Service provides for them will depend upon federal appropriations and also to some extent on what other landowners do. Thus far appropriations have been inadequate to keep up with the demand.

Whatever the Forest Service does on land now in federal ownership, it is unlikely that any substantial acreage will be added to the national forests as long as private forestry continues to make satisfactory progress.

The national park areas also are over-run. During 1959 more than 3 million people motored through the Great Smoky Mountains National Park. Day after day expectant campers had to turn away from overcrowded campgrounds. Traffic on the single approach road often crawled along bumper to bumper. If total attendance at this park keeps on increasing at the rate of 160,000 every year, as it has for the past decade, what are the park officials going to do? How long can a half-million-acre park be maintained as wilderness under such pressure?

Creation of additional national parks in the South is not likely, mainly because there are few scenic

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areas left in the region of a caliber to merit such a designation. It is possible, however, for the National Park Service to establish more areas like the Cape Hatteras National Seashore Recreational Area. Padre Island, Texas, has been recommended for such use.

Attendance at state parks is increasing at approximately eight per cent annually. In 1959, the 361 state parks and monuments in the South received 38,926,399 visitors. If these people were spread out uniformly, there would be 69 visitors per acre compared to 7 per acre for the Great Smoky Mountains National Park and slightly over 1 per acre for the southern national forests.

Last summer I had occasion to review the state park program in North Carolina. Nearly half of the total acreage is water. The land area, less than 20,000 acres, is too small. At several lakes the state owns all the water area, but has no adjoining land on which to construct camp-

grounds, picnic tables, or service facilities. Nevertheless, the demands of picnickers, campers and hikers continue to mount.

Informed observers say that North Carolina should enlarge its park system to 100,000 acres within the next decade and double that acreage by the year 2000. Much of the additional acreage would be forest land.

At present there is little to indicate that such an expansion of the North Carolina state park system is likely to occur within the next few years. Appropriations are relatively small and there is little sentiment for a bond issue such as that recently voted by the state of New York.

The extent to which federal and state governments will be forced to supply recreational facilities will depend to some extent upon the willingness of local units of government to provide for local residents. Very few counties or cities have met this responsibility. In North Carolina only one county and a half dozen

municipalities have forest type parks outside city limits.

A Final Comment

Sometime ago I spoke to members of a forestry association about the park system in their state. I recommended that the association, which is oriented toward timber production, expand its program to include state parks. I felt that eventually the park system would expand anyway, and it might be at the expense of commercial forestry. If the two programs could be wedded in the beginning, each might retain its objectives with a minimum of conflict.

Several of the foresters present expressed surprise that I would talk to them about parks.

Later, park advocates, on learning of my suggestions, said they would make better progress through sponsorship by a non-forestry group.

Such a situation would be unfortunate, especially if one or both organizations launched militant crusades.

"Potomac Prospect"

(From page 23)

The Coordinating Committee's Plan is an entirely different approach than the two plans mentioned above. This plan would provide for the gradual elimination of all pollution in the waterways, moderate flood flows, and insure an adequate water supply. This would result in clean waterways throughout the basin and preservation of their natural environments. Obviously the goals of all three plans are similar, but the Coordinating Committee's Plan would accomplish its objectives without the use of high dams.

Under the committee's plan the elimination of pollution would be accomplished progressively over a period of 40 years through a 4-point program:

- 1) No raw sewage from any source should be permitted to be discharged into the waterways after 1975.

- 2) Sewage plants would remove at least 90 per cent of all contamination by 1975, and 100 per cent of the contamination by 2000.

- 3) No industrial wastes or water used in industrial processes which contain any harmful contamination would be permitted to be discharged into the waterways.

- 4) By the year 1970 all farming, urban development, and timbering within the Potomac and Patuxent Basins would be obliged to comply with modern soil conservation techniques and reforestation practices.

Contending that "even with dams, flood control has proved far from being 'flood proof,'" the committee proposes a three-point program to moderate flood flows.

- 1) Legislation to require compliance with modern soil conservation techniques, timbering and reforestation practices—"With the development of the basin," the committee points out, "ruthless timbering procedures for structural lumber and pulpwood and improvident farming techniques have robbed much of our land of its natural tree and plant cover, runoff has increased, and high waters have risen progressively higher in our waterways. Based on soil conservation techniques, if an adequate program of reforestation were put into effect and if modern soil conservation techniques were adopted in farming and in urban development, the runoff during rainfall and snowmelts would be so reduced as to cause little serious damage."

- 2) Zoning flood plains—The committee maintains that the most elementary way of avoiding flood damage is not to build structures in areas subject to floods. It recommends that the building of structures, residential or industrial, on flood plains be strictly prohibited by "zoning" at the local or state levels.

- 3) Local structures to protect existing improvements where justified from economic considerations—For-

tunately, there are few populated places in the flood plain which are unprotected. However, where they do occur, the committee proposes local flood control structures to protect existing improvements. "Wherever there is economic justification, upstream dams to control floods on the tributaries and to stop flash floods in the mountains should be constructed."

The Coordinating Committee believes "that the plan it advocates for the elimination of pollution in the waterways of the Potomac and Patuxent Basins, for an adequate supply of safe water at an economical cost for domestic, industrial, and irrigation uses, without the necessity for high dams and huge impoundments in the waterways, for flood moderation, and for the preservation for all time of the natural environments of our waterways that constitute large and vital parts of man's necessary contact with undecorated Nature, is the only choice that would comply with the laws of enlightened logic and meet the standards of a nation with the culture and wealth of the United States."

Anyone interested in studying these proposals in greater detail may obtain copies of *Potomac Prospect* at \$1.00 each by writing to the Coordinating Committee on the Potomac River Valley, 709 Wire Building, Washington 5, D. C.

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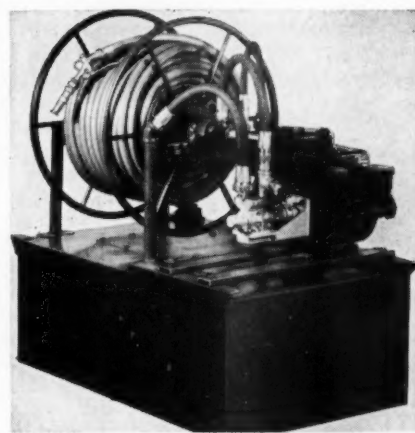
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Canada Drives to Cut Woods Costs

(From page 31)

two-fifths (43%) merchantable wood. The Institute having gathered the information, it will then be up to management to decide on the type of equipment needed, Mr. Besley said.

Several other projects in the series of "Forces Involved in Logging" would involve measuring the force required to skid trees of different size, with and without tops and branches. "Separate analyses would be made for each of the major species and for various representative types of forest floors used in the studies," Mr. Besley explained. "After suitable definition and classification of the various forest floors most commonly encountered in Canadian pulpwood logging, the loads which such floors will support will be measured. . . . A second phase of the project would be an investigation of the possibility of developing a tool to measure, rapidly and directly, the 'bearing pressures' of forest floors."

Mr. Besley reports that a long-term project on the forces involved in pulpwood holding grounds is expected to be completed during 1961. In-

asmuch as about two-thirds of Canada's pulpwood gets into the water in at least one stage of its journey to the mill, the Institute has been working on studies to determine how the holding grounds could be constructed so as not to permit the loss of wood, and yet not be unnecessarily durable (and unnecessarily expensive).

The chief factors in determining the necessary strength of a holding ground are the amount, or "head," of water backed up by the log jam and the force of water surrounding the jam. These factors are, in turn, determined by the velocity of the current, the depth of the jam, and the depth of the water under the jam. Because field measurements were difficult, sensitive to changing weather conditions, and had to be made within a distressingly short period each spring, extensive use was made of laboratory models to fill in the data.

The results of these studies, although preliminary, have already had wide distribution and one company which built a large holding

ground during the course of the study has reported that its actual measurements were within 7 per cent of those predicted in the Institute's calculations.

As a result, the company saved over quarter of a million dollars in the construction of the holding ground.

As the river drive is not always feasible, Mr. Besley continued, the Institute has conducted limited studies on transporting wood chips by pipeline—a proposition that offers great possibilities, some Canadians believe. "The trend towards continuous chemical piping," he related, "and the successful manufacture of high quality mechanical-type pulp from wood chips, has made it desirable to deliver pulpwood to the mill in the form of chips, ready for pulping. The Institute study has been concentrated on three factors: damage to chips, practical concentration of chips in the water slurry, and friction losses."

The Pulp and Paper Research Institute of Canada has also been conducting studies in tree and wood

MINNESOTA LANDS-

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& RELATED LANDS**



By

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characteristics and optimum conditions for regeneration and growth.

In addition to the previously mentioned need for handling and transporting trees at minimum cost and maximum efficiency, Mr. Besley explained that "a further need of the pulp mill is a reasonably uniform supply of raw material in order to produce a uniform product. There is a great deal of variation not only between the wood of different species but also in the wood from different trees of the same species. It will be a long time before Canada is breeding and cultivating a substantial portion of its pulpwood for quality and uniformity."

While any desired paper can be obtained by mixing fibers of different characteristics and while different papers have different requirements, it would simplify the question of arriving at the proper mixture for a specified type of paper if accurate analyses of the wood characteristics could be made in the field prior to the arrival of the wood at the mill.

"It is hoped that the results from studies of this nature will furnish the forester guidelines for prescribing silvicultural and cutting practices of predictable response," Mr. Besley said. "Field trials will be required to prove their worth to his specific area, but meanwhile, he will be able to recommend treatment with a fair degree of assurance.

Where the Buffalo Roam

(From page 5)

fection and control measures taken by the commissioners to wipe out the infection, Dr. Smith recommended the county's request for restocking be granted.

Immediately the commissioners started negotiations for a new herd. They learned that they could procure six young bison from the U. S. Department of the Interior, but the animals could not be shipped from western preserves until the fall of 1961.

Negotiations were then concluded with Zoorama, a Virginia animal-raising corporation, for eleven buffalo immediately available. The eleven prize animals, two bulls and nine cows arrived at the preserve the first week in November. They are domesticated, having been raised in enclosures like tame farm animals and will be allowed to roam at will over the preserve as did their predecessors.

One member of the Trexler herd that escaped the fate of his fellows is a young bull who was adopted by

"We in the Canadian pulp and paper industry feel that we are just beginning to come to grips with our need for woodlands research. There are only a handful of research foresters in all our companies. But when we realize that over 150 individuals from company woodlands departments are carrying out experiments on their own which they reported to us, not to mention the perhaps even larger number who did not report, we can be encouraged. Furthermore, the enthusiastic assistance which the Institute has invariably received from the woodlands operating staffs of the companies, whose limits provide our field laboratories, is heartwarming indeed. For every one of us, there are a dozen company foresters making substantial personal contributions in word and deed to the progress of our researches. Our associates in other organizations conducting woodlands research report the same kind of industry cooperation. With the stepped-up programs of woodlands research already under way in Canadian governments, industry, and universities, I predict real progress in the next decade."

All of which leads AMERICAN FORESTS to believe that Mr. Besley may be well on the way to building a third monument for forestry and forestry research.

a U. S. army battalion. About six years ago the 510th Tank Battalion stationed in Germany requested a buffalo mascot of the western state from which most of the members hailed. The American bison was the insignia of the unit at the time, although it has since been changed, along with the unit designation.

The state was unable to comply with the request. However, the item appeared on the news wire services and Mr. Tom Wirts, a reporter on the *Allentown Call-Chronicle*, called the matter to the attention of the Lehigh County commissioners.

The commissioners voted to present a young bull calf to the armed unit and subsequently the calf, "Geronimo" as he was promptly named, arrived in Germany and became the treasured mascot of the battalion. Geronimo brought his young friends plenty of unique problems, but it didn't take him long to live up to their expectations and become a magnificent bull bison.

The commissioners intend to add

to the new herd by accepting the six animals offered by the Wildlife Commission for the fall of 1961.

All of the animals are of breeding age and it is hoped that with this nucleus of fine stock the preserve will again boast the largest herd of American bison east of the Rockies grazing at liberty in a beautiful natural setting.

National Parks

(From page 43)

Among the South American countries, Argentina, Brazil, Chile, Peru, and Venezuela have all established national parks, but Nahuel Huapi in the Andean region of Argentina, first of the South American national parks, was not initiated until 1903.

Most of the action previously noted was undertaken separately by the various nations concerned, but by 1933 initial steps toward organized international interest on this form of land use began to make itself felt. In that year, upon the instigation of Great Britain, the first international Conference for the Protection of Fauna and Flora of Africa was held in London. At this meeting, a result of growing concern for modification of natural environments in Africa, recommendations were made concerning the establishment of national parks and reserves, as well as the passage and enforcement of hunting regulations to limit unnecessary slaughter of native wildlife.

Later meetings of this body were held in London in 1938, and at Bukavu, Belgian Congo, in 1953. Similar conventions at which problems relative to the Pacific area and the Far East were to be discussed were also scheduled for 1939 and 1940 but these had to be abandoned because of World War II. However, in October 1940, the Convention on Nature Protection and Wildlife Preservation in the American Republics was developed at the Pan American Union in Washington, D. C. This resulted in the preparation of articles aimed at better protection for the flora and fauna of North and South America; it was signed by representatives of various governments attending. Finally, in 1948, the national park movement assumed a truly international flavor. In that year the International Union for the Protection of Nature was formed at an international conference held at Fontainebleau. This conference was called by the French



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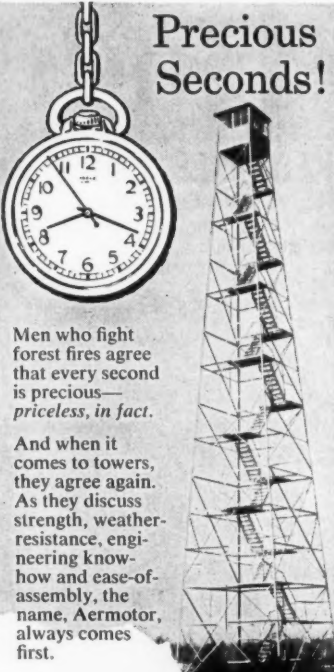
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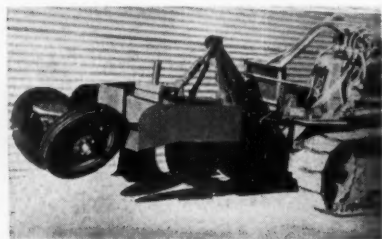
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government with the joint sponsorship of UNESCO. Subsequent meetings of this organization have since been held at various cities throughout the world.

The purpose and objectives of national parks and related areas in different parts of the world are fundamentally the same. In general, they were established to preserve unique and significant interests of various types for human benefit and understanding. However, due to differences in population, economic status, past land use, and cultural background typical of various countries, the basic administrative philosophy and details of management of such lands differs. For instance, national parks of the Belgian Congo are viewed largely as strict nature reserves with general public use either prohibited, except by special permission of administrative authorities, or very strictly limited and controlled. At the opposite extreme many national parks and reserves of certain Australian states lean strongly toward the "outdoor playground" concept with considerable emphasis placed upon provision of facilities for outdoor sports.

However, the management of most national parks and related areas throughout the world follows various types of a midway course, not unlike that typical of such areas in the United States. This is particularly true in Canada, in the five South American nations which have national parks, in New Zealand, and in the majority of South African countries. In the latter instance, with particular reference to the justly famous and well known Kruger National Park in the Union of South

Africa, visitor movement is more strictly regulated, largely because of the nature and habits of indigenous wildlife which is the particular interest of such lands.

Lands included within most national parks and related areas throughout the world are nationalized, as in the United States, but obviously this is not practical in countries characterized by a dense population or a long history of intensive land use, as in Great Britain and Japan. Both these nations have extensive national park systems but specific areas customarily include lands owned and operated on a different basis. However, where circumstances force the acceptance of certain types of competing land uses, great care is exercised in the maintenance of aesthetic beauty and natural interests.

There is also a wide variation in the size of individual areas of this type throughout the world. Some embrace millions of acres; others are so small that the term "national park" would seem to be a misnomer. The table on page 43 lists the more important areas of this type with a gross area of greater than 1,000,000 acres. These figures will be more meaningful when compared to the areas of certain of our own states, such as Rhode Island (776,960 acres), Delaware (1,316,480 acres), Connecticut (3,205,760 acres), and Massachusetts (5,289,480 acres). On the other hand, several areas known as national parks in such countries as Belgium, Sweden, the Australian states of Queensland, Victoria, and Western Australia, the Philippine Republic, and Mexico are less than 100 acres in extent.

Reading About Resources

(From page 6)

voyageurs' experiences in this wild land of water in western Canada. Justice Douglas writes in *My Wilderness* (Doubleday, New York, 1960. 206 pp. \$4.95) of the Pacific Northwest which he—and countless thousands of people—has come to love as only a man can do who has tramped the land on foot, not once but many times.

The Olson book is heavy with history. The Douglas book is intensely personal. Both men are on intimate terms with their chosen sections of the natural world. They know what they are writing about—and they know how to write.

This is wilderness as an individ-

ual experiences it. To travel with either Olson or Douglas is next best to traveling one's self.

There are other books which should be mentioned. I may not have picked the four best, but I have certainly selected four of the best which reflect the maturity and stature that have come to the wilderness movement.

There is much good reading in the books I have mentioned, much useful and important information. Most of all, however, there is implicit in publications of this quality the confidence that the wilderness movement is here, not only to stay, but to triumph.

The important thing is not which viewpoint carries the day, but that the legion of men dedicated to a common cause persist in discussion until there is a clear goal, and reasonable means for achieving it, to

which most wilderness folk will subscribe. Without a large measure of unity, we can expect nothing but the dissipation of that wild nature which is memorialized in these four books.

No Time On His Hands

(From page 29)

trees. I gave him a bow saw and told him he'd have to do some mighty fast cutting and carrying to get 500 trees out in daylight hours.

"Then I wondered what they wanted so many small trees for—and at \$1.50 each. So as soon as I got dressed I went out and asked the driver. 'Oh,' he said, 'they're for people who live in apartment houses and house trailers. There's a great demand for these small trees this year.'

"Well, that made me feel good. Here were people living in small quarters who wanted that little traditional touch of Christmas that only a genuine Christmas tree can give."

Mr. McIntyre's plantation ranges from seedlings to 9-year-olds. Half of the trees are Scotch pine, a popular Christmas tree in the East.

"White pine is fast gaining in popularity," Mr. McIntyre reports. "It got quite a boost when Pennsylvania's Governor and Mrs. Lawrence selected a white pine for their Christmas tree."

Mr. McIntyre is growing about 10,000 white pines. Next in numerical order come white and Norway spruce, Douglasfir, and Banks and Austrian pine. He buys his seedlings from a nursery. He counts on a 15 to 20 per cent failure. It pays to buy high quality stock, he emphasizes.

Mr. McIntyre figures that it costs him an average of 94 cents to bring a Christmas tree to an 8-year marketable size. At his selling price, \$1.50, that leaves him a margin of 56 cents return per tree. He breaks his costs down this way: seedling, 4 cents; planting seedling, 3 cents; mowing, 11; shearing, 24; insect control, 5; seedling losses, 12; unsalable trees, 10; and overhead, 25. The overhead includes land, taxes, and equipment depreciation.

"No matter how hard you work with the trees, nursing them along, shearing them regularly to get good form, some of them just won't end up pretty enough to sell," Mr. McIntyre said.

Though he is in retirement from his professional work, Mr. McIntyre does not do all the chores on his plantation. He doesn't have that

kind of time. He's busy with other things, such as editing *Pennsylvania Forests*, official publication of the Pennsylvania Forestry Association, and looking out for the welfare of Howdy, that little raccoon rascal whose mission in life is to persuade everybody to use good outdoor manners. So he depends on outside help to do most of the plantation work. High school boys do some of it. Much of it is done by men who are available during slack periods at mushroom houses where they work regularly. Mr. McIntyre himself does just enough of the work to make life zestful.

Mr. McIntyre used a tree planter to get his plantation started in 1952, the rows being laid out on the contour. Since then, the trees have been planted by hand. He keeps the soil covered with grass but scalps a small square for planting a seedling. High school boys mow the grass with a rotary mower during the summer. Hired hands shear the pines in June and July and the spruce trees in the fall and winter.

Along with cultural problems, Christmas tree growers are faced with the increased danger of over-

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production and under-selling. There are also sales limitations brought about by laws or ordinances against the use of Christmas trees in public buildings because of fire hazards. Another factor is the competition from artificial trees, the latest in this line being made of aluminum. Yet Mr. McIntyre believes that Christmas tree production can be profitable if growers go about it in the right way. Growing Christmas trees is a farming enterprise, he points out. There's no easy way to Christmas tree profits, but they're there if anyone wants to work for them, he feels.

Mr. McIntyre also believes that

organizations of growers can help. That's why he belongs to the National Christmas Tree Growers' Association, Inc., and the Pennsylvania Christmas Tree Growers' Association. He is also a cooperator with the Chester County Soil Conservation District. Through the district, he is entitled to technical help on his soil and water conservation program from the U. S. Soil Conservation Service, his former employer. He has little need of such help, however, for his years of professional work have left him well steeped in the principles and techniques of soil and water conservation.

Land, Water, and People in India

(From page 19)

tribute 52 per cent of the total debris discharge. For example, a recent earth-rock slide from Brahmanand Khola above Chatra, Nepal, pushed the Kosi against the cliff opposite the Khola's mouth, causing a huge section to break off. All but the heaviest of this material will inevitably move downstream into the pool above the barrage.

Effort Still Pitifully Small

In 1957 a pitifully small Soil Conservation Research and Demonstration Center, financed in part by U.S. technical aid funds, was established at Chatra, Nepal, a few miles below the junction of the Kosi's three major tributaries. Under a cooperative agreement between the Indian and the Nepalese governments, the 213-acre watershed of Durvasa Khola is being gauged for study and experimentation. An ecological survey is also underway on the Kosi watershed itself.

This agreement runs for a mere 10 years, apparently under the illusion that all the necessary research on the

control of the local mountain torrents and on the development of more stable agricultural and forest practices will have been completed by that time!

Following our field inspection of the Chatra research center in December, 1959, my Indian counterpart and I reported to the government of India and to my agency, the FAO, that "no country in the world, however advanced technologically, has been able to build a project in areas of heavy sedimentation without being forced . . . to provide for continuing control and repair measures of one kind or another over long periods of years. India is no exception, so far as the rampaging Kosi is concerned. . . . In our opinion, it will take an outlay of between one and two per cent of the construction and maintenance costs of the major engineering works to finance the required research program."

In recommending that the agreement with Nepal be extended to provide for at least a 25-year lease of land on which experiments would be undertaken, we explained that the Kosi's problems were much too complex to expect any substantial results from research in less than that period. We recommended an expansion of the very modest watershed research program with special emphasis on side-slope and channel stabilization, involving studies of combinations of agricultural and forestry practices and small-scale engineering structures.

The Kosi project is but one of the many urgent food-oriented schemes whose effectiveness and very life depend on how well sediment can be kept off fertile floodplain farms and out of reservoirs and irrigation

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canals. Another essential scheme is the imposing Bhakra Dam and its Gobindsagar Reservoir on the mighty Sutlej River, a tributary of the Indus River in the Punjab and Himachal Pradesh (states of northern India). This undertaking, by providing hydroelectric power and irrigation water, will facilitate industrial development and step up agricultural production. Many poverty-stricken townsmen and villages now unemployed or underemployed will thus benefit. But even before this great engineering feat is consummated, its useful life will have already been shortened, thanks to the ill-conceived forest land clearing by Himalayan Mountain villagers eager to grow more crops, and by the uncontrolled grazing of their livestock.

Highway Program Poses Problem

Still another serious threat to the Bhakra project's future is the stepped-up program of highway and road construction to make the border regions along the Himalayan ridge more accessible. This program is terribly vital to the nation's economic and social advancement and to its military security against an aggressive neighbor. But unless carefully designed safeguards are applied to minimize the accelerated soil losses and landslides which such construction commonly entails, far greater damages by floodwaters and debris to food-producing areas may result than those attributable to overgrazing. There is no sense in adding unnecessarily to the already backbreaking burdens that the people must assume to catch up with their minimum sustenance requirements. Every acre of good bottom-land destroyed or otherwise taken out of production by whatever cause represents a loss equivalent to the removal of many acres of hill land. Highway construction should not be permitted to contribute to such losses.

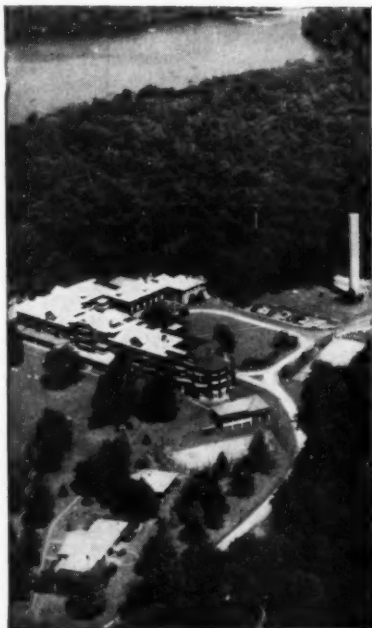
What of the transportation systems themselves? Roads to bring markets closer to villages and to facilitate trade and military movements are of little avail if traffic is repeatedly halted by washouts or landslides, especially when the monsoon rains come. During 1959 I traveled the major highway from Dehra Dun—site of the central government's Forest Research Institute, Indian Military Academy, and Ghurka Troop Training Camps—to the Himalayan hill station and military post of Chakrata in Uttar Pradesh, about 60 miles to the northwest. This long-established thoroughfare and

bus route serves important business, agricultural, and military needs. Yet frequent landslides disrupt its use for weeks at a time. Trans-shipment of persons and goods from one side of a particularly severe slide area to the other is a regular practice at such times.

Detailed study of the causes by Dr. R. S. Gupta, a soil scientist, formerly director of the Central Government Soil Conservation Research, Demonstration and Training Center at Dehra Dun, and my own observations definitely relate the slides to the cultivation of steep slopes on slippery shale material directly uphill. The usual chaotic livestock grazing is a further aggravation. Yet despite the clear-cut evidence no action has been taken by the state authorities to correct the difficulty at its source by acquiring the land, reforesting the slopes, eliminating grazing, and applying drainage correctives. Instead, whenever a slide occurs, bulldozers and hand labor are deployed to dump the displaced soil and rock over the side of the highway onto the precipitous slope below! Here the material has no chance to rest until it reaches the watercourse, whence subsequent flood flows will dump it on productive lands and habitations downstream.

Engineering Not Only Answer

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they can in the United States, Europe, or Latin America. Heavy sediment loads plague even the famed TVA-modeled Damodar Valley reservoirs in the state of Bihar. Yet only as recently as 1959, the chief administrators and governing board of the Damodar Valley Corporation apparently chose to gloss over the fact that the unspectacular but effective soil and water conserving practices, and the modest program of research on crop and forest lands in that valley must be greatly strengthened, and financed on more than the existing meager and uncertain basis.

The Ford Foundation report previously mentioned makes no bones about the urgency of correcting such unsatisfactory situations. "The need for erosion control to get on-site benefits to crop, grass, or forest production is clear. But erosion control is also needed in those catchment areas where the accumulation of erosion debris seriously shortens the life of water-storage reservoirs. . . . We, therefore, recommend that: Allotments for conservation work should be made in all financial plans for public water-storage structures, and such work should be timed for early completion. . . ."

Despite the protestations of top-level administrators and political leaders, the attitude toward the research aspect of India's forestry and other conservation activities may be characterized as one of indifference and neglect. Intellectual and scientifically-oriented leaders like Vice President Sarvapalli Radhakrishnan with whom I discussed these matters both on entering and leaving India are painfully aware of this deficiency, but apparently are unable to correct it. The neglect of scientific research, and especially of the scientists themselves, is highly detrimental to India's development, as my own observations, official government reports, and frequent items in *The Statesman* and other Indian newspapers attest. William Vogt, in *People!* comments that despite the shortage of college-level technical educational facilities, a recent survey showed that of 578 students who returned in 1959 from study abroad, 47 per cent with graduate degrees had no jobs.

Land Misuse Calamitous

Indian foresters as well as agriculturists are fully aware of the calamitous consequences of land misuse. India's 170 million acres of forests occupy 22 per cent of her total land area, but only about 116 million

acres are considered "productive and accessible." This area amounts to only 10 per cent of the per capita acreage of U. S. forests. About 80 per cent of the forest land (much of which actually has been denuded) is owned by the 15 states. Twenty per cent is in various forms of private ownership, and less than one-half of one per cent is communally owned.

Unfortunately the state forestry organizations are ill-equipped to cope with the insistent pressures of villagers to clear additional forest reserves or step up the grazing overload still more. Villagers also are prone to resist proposals to rehabilitate wrecked lands by reforestation, and especially fencing against the ubiquitous cattle, sheep, or goats.

One important reason for the relative helplessness of India's foresters to end these abuses is the widespread lack of technically sound information on the specific effects of abusive practices. During the course of my visits to several Indian states, the forest officers frequently bewailed their inability to convince high state officials to weigh carefully the villagers' importunations for more acres to cultivate, or too hastily to accept the villagers' charges of unsympathetic administration of the forests. Yet on questioning my fellow foresters I found virtually no objective scientific data to support their contentions against further clearing or grazing.

Main Emphasis on Timber

Such situations prevail because forest research by the Indian states is overwhelmingly confined to the timber production aspects. Furthermore, insofar as professional foresters are concerned, the studies are conducted largely by persons inadequately trained or mentally oriented

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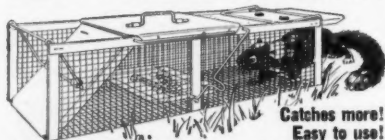


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to conduct scientific research. The standard practice is to assign foresters to research either in the state or at the Central Forest Research Institute by temporary transfer from administrative duties, commonly on a 2-year detail, and rarely over 5 years. Then they are shifted back to other duties, quite remote from the requirements of scientific research.

Educators and scientists well recognize that the practicing forester is essentially a professional person rather than a scientist, although his practice must have a scientific basis. As S. T. Dana, dean of American forestry educators, stresses, the scientist deals primarily with the acquisition of knowledge, whereas the professional person deals with its application. Neither can replace the other; both are essential.

Indian training in the complexities of watershed management—a very essential aspect of both forestry and agriculture, since it bears so directly on the success or failure of the food production program—is absent or else on a highly empirical or hit-and-miss basis. That such training and research are necessary is thoroughly recognized, at least on paper. The reason for my being called to India on the FAO mission was precisely to help overcome these deficiencies. Ironically enough, on my arrival, I found that several of my personal acquaintances and others who had invested considerable time and expense, both personal and governmental, for studies in the United States or elsewhere were engaged on duties quite remote from this field.

Watershed Management Training is Great Need

So far, the only systematic and practical training in the practice of watershed management which some foresters receive is through assignments from their states to the U.S. financed Soil Conservation Research, Demonstration and Training Centers earlier referred to. It is worth noting that only a small proportion of these trainees are diplomats of the central government's Indian Forest College at Dehra Dun, the one and only high-level forest school in Hindustan. Rather, the bulk of the trainees are graduates of one of the nation's two Forest Ranger Colleges. As such they rank one usually unclimbable step below the forest officer class. These forest rangers will later return to their respective states, often to serve under forest officers who are quite likely to lack the specialized understanding needed to

supervise adequately the work of their subordinates.

By contrast with the commonly held biases and dogmatism of some professional foresters, especially at the higher supervisory or administrative levels, the Indian research engineers whom I encountered seemed quite open-minded and avidly inquisitive in their views. For example, during a visit to the Irrigation Research Institute at Roorkee in Uttar Pradesh, I enjoyed a lively seminar on the influences of forests on climate, floods, etc. In preparation for my arrival, the research staff put together a number of highly pertinent and searching questions on the subject as follows:

Questionnaire for Mr. Bernard Frank

1. What is the role of forestry in the hydrology of river catchments?
2. What are the changes effected in the hydrology of a catchment consequent upon changes in the pattern of forests, land use, watershed management?
3. Is it borne out from scientific evidence that floods are on the increase, and that the same is being caused by deforestation?
4. What are the exact factors to be studied and how are their effects to be assessed in investigations on deforestation so far as it affects the runoff from catchments?
5. What factors are to be studied in land use and watershed management so far as they affect the hydrology of a catchment? How should their effects be studied?
6. Sometimes deforestation is necessitated due to increasing demand for timber or more land. Is it essential that this should invariably be accompanied by a planned program of afforestation? If so, could some concrete ideas be obtained for the same?
7. How is it possible to obtain literature from the United States of America and other countries regarding studies on forestry, land use, watershed management and their role in the hydrology of catchments?
8. According to some, forests play a great role in controlling weather, particularly rainfall, the more so, its pattern. How is this theory to be tested from scientific evidence?
9. Is it possible to reduce the frequency and intensity of floods in catchments which have shown greater and greater recurrence of floods of late, by a planned program of afforestation?
10. While forests are supposed to have a vital role in affecting surface

runoff, has any evidence been gathered regarding the contribution of forests towards ground water runoff?

The frank discussion that ensued helped clear the air by indicating both the limitations and potentialities of forest cover and watershed management, as well as the types of basic data and research which would be required to answer the questions for specific areas and circumstances.

At the very minimum, Indian foresters and scientists in forestry and related fields would greatly benefit by carefully organized basic courses in watershed management oriented as nearly as possible to Indian conditions—the cultural equally with the physical. These courses would involve both classroom and field study and practice directly related to specific watershed problems and their remedies. They would provide opportunities to analyze specific situations and work out reasonable solutions or approaches, including the installation, operation, and maintenance of the necessary measures and measurements of climatic factors, vegetation, soil and water characteristics, etc. The students would also examine actual research projects on the experimental farm and forest watersheds of the several Soil Conservation Research Demonstration and Training Centers in India and Nepal.

Shift in Emphasis Vital

Altogether, the extent to which India's forests can help protect food-producing lands from destructive floods and impaired water supplies will depend on how far the central government, and especially the several states are willing to shift part of their present emphasis from growing wood to improving watershed conditions. At present, the most tangible sign of such a shift would be the conduct of a comprehensive nationwide watershed survey as recommended in my final report to the government of India. This survey would permit a classification of the

nation's watersheds or river basins according to their physical characteristics, their contributions to damaging floods or other factors which hamper food production, the land use practices which appear largely responsible, the measures required to ameliorate existing difficulties, and the relative urgency of remedial programs in given localities. These evaluations would consider the economic and social values at stake, and the prospects for early relief from remedial programs.

The survey would investigate the need for acquiring basic data on precipitation, streamflow, ground water, sediment production, etc., and recommend step by step a program for overcoming existing basic data deficiencies.

To undertake such a project would require the services of many technical fields besides forestry. Soil scientists, ecologists, meteorologists, geologists, hydrologists, sociologists, economists, and statisticians would also be essential. Whether the necessary coordination of technical and scientific disciplines could be obtained—and maintained—is admittedly problematical. Yet without such interdisciplinary endeavors, it remains questionable if India can hope to win her race for social, economic, and military security.

Underneath all these problems and possible solutions lies the overwhelming need for a much sharper appreciation of the role of scientific education and research than currently prevails among India's officialdom. Dogmatic and arbitrary actions by professional administrators must yield to policies and procedures based upon scientifically tested findings. Above all, scientists, technicians, and professionally trained workers must have adequate opportunities to assert and exercise their knowledge and to help determine policies and actions. Here clearly is a challenge to India's top-level leaders to remove the cultural blocks to utilizing the talents of these working for India's welfare.

The "Hydronauts" Come of Age

(From page 11)

should be handled as multi-purpose projects. The needed projects would embrace nearly a billion acres, or half the land area of the United States.

"These figures show us that we have barely started on the needed watershed treatment," Mr. Williams said. "The 53 million acres in the

projects now authorized for operations is just about five per cent of the area needing project action."

Mr. Williams further revealed that as the nation's concept of conservation broadens, "and as we better see the importance of agricultural lands to all renewable resources, it is appropriate that other

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agencies besides the Soil Conservation Service participate in the activities of Soil Conservation Districts and watershed projects. Surely, we all can benefit, and the national welfare will be served, by working relationships that will coordinate the contribution that each can make to land resource conservation.

"We are constantly studying means for better coordination of the various public conservation services to be made available to local organizations," Mr. Williams said. "Technical assistance, education, cost-sharing, and credit need to be used in combination to deal effectively with the peculiar problems of each locality or region."

How rapidly the remaining 95 per cent of our watersheds get the treatment will depend on: 1) the appropriations climate in Washington which was termed "most favorable" this year by leading water specialists; and 2) crusading missionaries at the grass roots who will carry projects through to completion—people like L. L. Males, president of the Security State Bank, of Cheyenne, Oklahoma. In an inspired address, Banker Males told the Congress what his people had done back home on the Sandstone Creek sub-watershed of the Washita River Basin. To obtain flood prevention, stabilized stream flow and some irrigation, people in the Cheyenne area launched a program to keep the young folks on the land by starting land treatment measures that are now paying off in terms of stabilized soil conditions, bigger crop yields, more jobs, and more income.

"Being a banker, I am interested in both jobs and income for our people and I can tell you that the way to achieve these, and to keep young people from going to the cities, is to make our agricultural land safe and productive," Mr. Males said.

Broad aspects of multiple use management of land were explored at the Congress by R. E. McArdle, Chief, Forest Service, (represented by Regional Forester Fred Kennedy); H. G. Wilm, Commissioner of Conservation, New York State Conservation Department, Andrew L. McComb, Department of Watershed Management, University of Arizona, and Karl S. Landstrom, Director, Bureau of Land Management. However, delegates to the Congress saw "multiple use" at work as well as hearing about it in their visits to the Arizona-Sonora Desert Museum and to the Santa Catalina Mountains

in the Coronado National Forest.

The tremendous recreational use on the latter was accented in this field trip directed by Supervisor Norman P. Weeden—and this, incidentally, was the same route pursued several years ago by members of The American Forestry Association. This also highlighted one of the most stimulating subjects discussed at Tucson—namely the place of recreation in planning for multi-purpose projects under P.L. 566.

Speaking on this subject ORRRC Executive Director Frank W. Sargent stressed that recreation in the past all too often has merely picked up the crumbs in multi-purpose planning. He stressed that outdoor recreation is now a big business and that in 1960, water-oriented Americans alone spent at least five billion dollars for boating, fishing, and swimming.

Recreation, Mr. Sargent said, "should be taken into the family and be allowed to sit at the table when the meal is being planned and when it is served—but this may well mean that outdoor recreation should bear some of the family expenses, too. I do not believe that the millions of Americans seeking a place in the water will object if they have to pay an equitable fee for this privilege or if a reasonable part of their tax money is spent to provide it."

Too busy in Washington to attend the Tucson Congress, Secretary of Agriculture Freeman sent his greetings anyway via a motion picture short in which he pledged Administration support to the small watershed program. The message was applauded by the delegates. This pledge of support was reaffirmed by Assistant Secretary of Agriculture Frank J. Welsh, who said, "We in the Department of Agriculture pledge that we will do our part in the immense job of building up natural resources adequate for all foreseeable needs. We will revitalize the nation's small watershed program to get more rapid action in meeting future water needs. We shall take strong and positive steps to achieve better management of small and privately-owned woodlands. We shall accelerate the work of our Soil Conservation Service in providing basic land use practices on farm crop lands. We shall rejuvenate the Forest Service's long-range program for the development and improvement of our national forests. We shall help develop a sound and full body of scientific

data to guide us in soil, water, forest, and range conservation programs. . . ."

Cape Cod

(From page 22)

parks. The one at Dennis Port—Grinnels Oceanside Park—is so close to the ocean you can smell the salt water and hear the pounding of the surf from the windows. And as for seafood—of course there are clams, lobsters, crabs, and all kinds of fish. The price is more than reasonable.

Most of the Cape's trailer parks started in the early days as camping grounds for the overnight tourist. Many are now being expanded into mobile home parks—but still specialize in overnight service.

Chatham, at the elbow end of the Cape, and neighboring Harwich Port are convenient to either end of the peninsula. Both are leading fishing ports. Monomoy Island is a sand strip where residents often picnic. And nearby Chatham light is the first light you see returning from Europe. Chatham, by the way, is fine shopping ground.

Thirty miles out to sea in the Sound is Nantucket Island, "The Little Gray Lady." She has a weathered-gray complexion from many years of living at sea. Her cobblestone streets are unchanged since the booming whaling days. Boats from Hyannis and Woods Hole leave for Nantucket daily.

The Cape Cod Chamber of Commerce is just outside of Hyannis on Route 132. The airport, too, is near where you can rent a car, seek information, and tour the Cape within an hour after you arrive.

Distances are easy on the Cape. You can scout and select the area you enjoy, then concentrate on it, or even pack up and find quarters there. There's such a variety of interests and activities, your first trip should be exploratory. It is said that you will—as everyone *does*—come back.

Undisturbed Forests

(From page 25)

such cases, areas which in composition and appearance no longer reflect past disturbance by white men are considered.

3. The minimum acreage of a single type has been set at not less than 10 acres provided it is surround-

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ed with an equal acreage of forest land to constitute a buffer zone.

4. Arrangements must have been made for the preservation in perpetuity of the area recommended. This may be either through an act of legislation, regulation, endowment, trust, will, or otherwise.

As of January 1, 1960, 128 natural forest areas located in 34 states and Puerto Rico have been accepted as meeting the standards set by the Society. Of the 106 forest cover types recognized for the eastern United States, 47 types are found within the natural area system. In the West, 36 cover types out of the 50 recognized are within the system. Considerable more effort is still required to locate and set aside the additional areas to complete the system. Most of the recognized natural areas are on federally owned lands, including the national forests, national parks, and national wildlife refuges. A few are located on state owned lands and a few on university properties. Only one is located on privately owned land.

Just what does the scholar or the research man find in a typical natural area? To begin with, they are not typical in the sense that the same type of growth is preserved over and over throughout the nation. Wherever possible, each area has its own individuality. In every case, an effort is being made to preserve some forest type or types in their natural state as grown naturally in any given region. In a sense, these areas are large sample plots, of use in studying how nature, unimpeded, grew a forest in comparison with recent efforts by man to carry on forest culture for high production.

Let us examine a little more carefully what some of these natural areas are like. Take the 940-acre Oak Creek Canyon Natural Area within the Coconino National Forest near the town of Sedona, Arizona. Here

the primary forest type represented is ponderosa pine with, however, a mixture of some Douglasfir, pinyon pine, juniper, sycamore, alder, maple, and several species of oaks. Of botanical interest is the presence of western hophornbeam, a rare species in this general area. Elevations range from 5,000 feet to 6,500 feet above sea level, and the topography, slope, and gradient are variable. Through this area range deer (both mule deer and white-tail), elk, bear, and even cougar. It is also the home of the colorful Abert squirrel. The fan-tailed pigeon, a frequenter of the cultivated orchards below, finds solace in the area. Here, then, is an undisturbed forest with a rich fauna—an area that has in past ages reached its present state of perfection under the dry conditions of the Southwest that will in the future be allowed to develop and change as nature wills.

Quite in contrast is the 230-acre natural area within the Upper Peninsula Experimental Forest (Hiawatha National Forest) near the town of Marquette, Michigan. This tract was selected primarily because here in one small area could be found several of the important types of the region—sugar maple, eastern hemlock, hemlock-yellow birch, northern white-cedar, black ash, American elm, red maple. The area has no pronounced topography. Very slight differences in elevation govern water relations, soils, and timber types. On the highest ground is the sugar maple which in the spring of the year is colorful with trillium, Dutchman's britches, and many other flowers. Progressing downward in elevation next appears the hemlock-yellow birch type, then the hemlock, the ash-elm-maple, and finally, in the wettest portion, the cedar. This natural area provides such a good object lesson in how the various forest types occur that it is visited regu-

larly by forestry summer camp students from the University of Michigan and Michigan State. A small area such as this cannot be said to provide permanent residence for many wild animals, but white-tailed deer, porcupine, and ruffed grouse are commonly encountered. Being adjacent to many experimental forest cuttings, an unusual opportunity is presented for checking natural development against forest management in practice.

The purpose for which these areas are set aside, namely, research, is being fulfilled slowly, as might be expected. As of 1960, research has been in progress on 29 natural areas. A brief summary of this research shows that studies in such matters as ecology, seed production, growth and mortality, ground moisture, fungi, insects, and soils are underway.

The Society's Committee on Natural Areas welcomes suggestions as to the location of areas which may possibly qualify as natural forest areas.

How large is the average natural area? Size is not particularly important here, but the Society's 128 natural areas total 135,000 acres and range in size from 20 to 6,000 acres. The point to remember is: *What is there is what counts rather than the immensity of the tract or the fact that a certain species is repeated thousands of times.*

For the Natural Forest Areas of the Society of American Foresters are truly little islands in time—and each area represents a future scientific oasis where the researcher of tomorrow, living in a world of genetically-perfect forests, may murmur to himself, "My, my, my. What imperfect runts these trees, in their awful primitive state, must have been!" Or again, he may with humility learn how puny are his own efforts and wonder anew how wonderful a forest was created without his assistance.

Point Reyes: An Island in Time

(From page 15)

ducing beef would go out of business under seashore management. The slopes of the Inverness Ridge, which now provide grazing for beef cattle, are high potential recreation land. Some of the 20,000-acre pastoral zone could be devoted to beef; in fact, if humans and dairy cows are not compatible, that would be the answer.

Regardless of what kind of cattle do the grazing, it will have to be done; the open down-like quality of Point Reyes is due to grazing. It is

likely that encroachment by brush would follow elimination of grazing, and much beauty and recreational value would be lost.

The immediate management problem of Point Reyes is grazing management. It will be essential for the National Park Service to hire the best available range manager as soon as Congress establishes the seashore. The range manager will then be able to initiate the necessary fact-finding studies to produce a balanced man-

agement plan for both pastoral and recreational areas. Grazing is part of the basic present plant ecology of the peninsula, and will have to be continued in portions of the seashore to preserve the present aspect.

The radio transmitting stations were originally established on Point Reyes because it was isolated. The transmitting sites, located in the pastoral zone, are a compatible land use with the seashore. The public will have to be kept off the 2,000-acre

sites themselves, and no vehicles can be allowed west of the transmitters. This is a simple matter of administration and presents no problem, as transmitters are located to fit easily into such a use regulation pattern.

Commercial fishing docks on Drake's Bay and licensed oyster farms at the estero would continue under national seashore plans and would provide an added public interest and service.

Some logging has been done on the inferior timber stands on Inverness Ridge. The lumber company working here voluntarily moved operations to the west, pending a decision on seashore legislation. They still own substantial timber rights on Inverness Ridge, which will have to be acquired by the government. Some conservationists hope the timber company could buy real property on the ridge and exchange it for government timberlands elsewhere. That provision, to simplify acquisition, has been written into the present bills.

Fishing and hunting would be jointly managed by the State Fish and Game Department and the Park Service under a cooperative agreement. The entire area is now closed to public hunting; under the seashore operation, a substantial amount of quail, rabbit, and dove hunting would be available in season. Proper management of the 2,500 deer on the area requires a heavier harvest than has ever been made. The possibility of closing the seashore to all uses but controlled deer hunting for a few days a year should be explored, and the area made a truly multiple use project. Fishing in lakes, streams, and the ocean would be permitted in the proper season.

Development of Point Reyes as envisioned by the Park Service is going to be comprehensive. Twenty-five miles of new roads, 25 miles of trails, 5 major picnic areas, 3 camp grounds, parking, and beach comfort facilities are among a few of them. Time, experience, and the pressures of nearly 12 million people who will live within the 13-county day-use radius by the year 2000 will have to give the final answers. Use will be heavy, far beyond present estimates. A new freeway to be constructed will bring Point Reyes within a few minutes of the Golden Gate Bridge, and connections with other portions of the California freeway system will make day-use easy from as far away as Sacramento. Uses and demands hardly dreamed of now will be standard on Point Reyes. Fortunately, the

terrain lends itself to a multitude of small recreational developments, rather than a few large ones. This method of development can enable large numbers of people to use the area and still feel the sense of isolation not possible when large masses of people must crowd together. The logging already completed can provide a start on small meadow-type picnic sites; more may be needed.

No provision has been made in the present bill for payment in lieu of taxes. Some proponents point out that all but the highest priced housing developments in Marin County cost more in services than they contribute in taxes. Point Reyes could well be one of these, they say, if housing areas take over.

Purchase methods prescribed in Point Reyes legislation are the same as those in other seashore proposals. An independent appraisal will be made of all property, using local private appraisers. The Park Service may allow an owner now residing in the proposed seashore to live in his home for life. The government would, of course, pay a lesser price in those circumstances.

Complete acquisition cost of the proposed seashore is estimated to be in excess of \$15,000,000. Pressures for subdivisions are increasing the values of the land and, consequently, its cost to the government. The scramble for subdivision sites appears to involve more land speculation than it does housing developments.

The recreation potential of Point Reyes is so high it is almost unbelievable; the most conservative estimates forecast 2.3 million visits a year to a national seashore by 1980. It has been undeveloped for all time, but that condition will not last. Congressman Clem Miller says, "A new dimension of urgency has recently been added to congressional consideration of the Point Reyes proposal. This is because subdividers have begun scraping roads and digging sewers in the rolling hills above the beaches of Drake's Bay, right in the heart of the proposed park area."

Point Reyes will be decided soon—it will be either a national seashore recreation area or a series of housing developments. If it is the latter, land economics spell the end of dairying and oyster farming. Both could continue as part of the integrated seashore management, but not as part of suburban living. Time is running out for the timeless land on Point Reyes.

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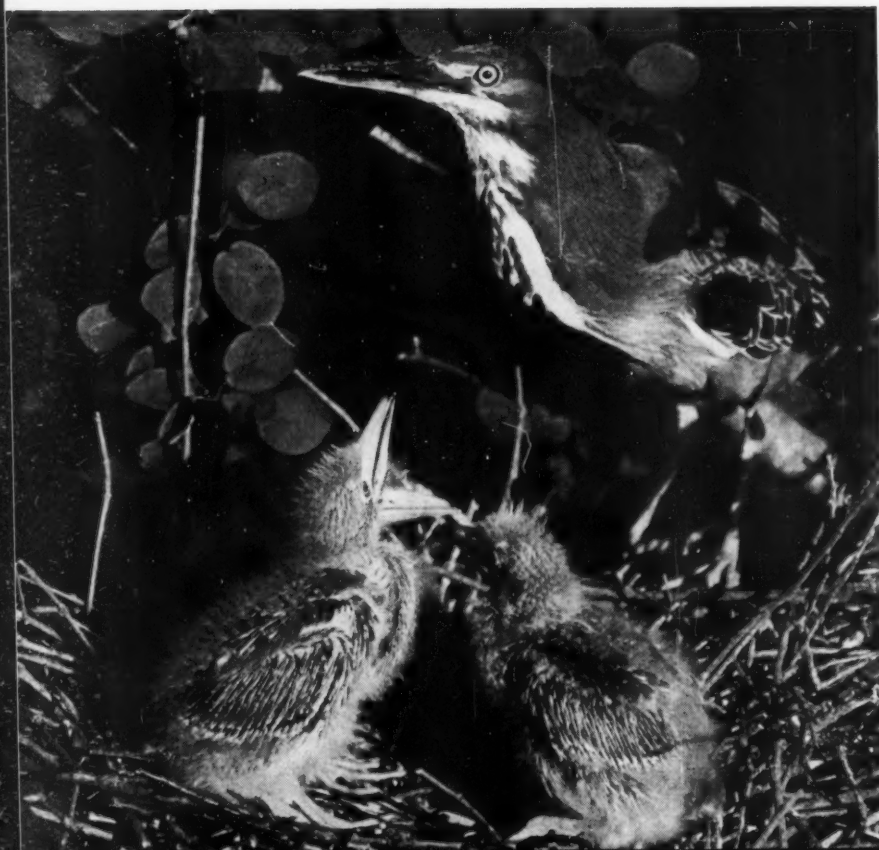
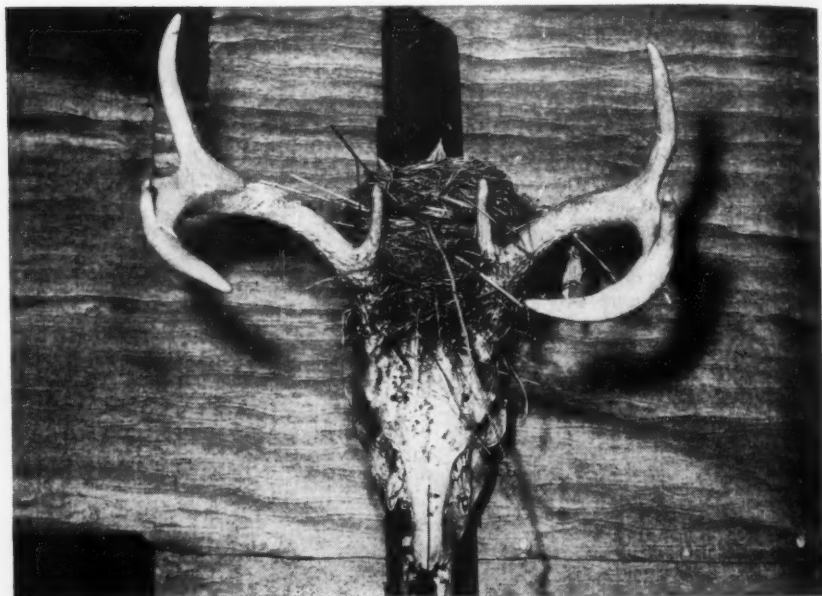
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Feature Photos of the Month

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It certainly must have been a matter of life and death when a robin selected this particular spot to build her nest and rear her young. Beneath the overhanging porch of a hunting cabin above Cayuga Lake, New York State two families of robins have been raised on the brow of the eight-point buck.

Photo submitted by Lou Fendrick, Ithaca, New York



In Washington State a green heron watches over its young. It is interesting to note, in these days of shrinking wildlife populations, that this bird is apparently extending its range. This is the first nest of this species ever found in this far western state.

Photo submitted by Michael Wotton, Centralia, Washington

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Party limited to 18

SAN JUAN WILDERNESS, COLORADO

JULY 17 TO JULY 27; JULY 31 TO AUGUST 10
\$235 from Durango, Colorado
Parties limited to 25

WIND RIVER MOUNTAINS, BRIDGER WILDERNESS, WYOMING

JULY 17 TO JULY 28; AUGUST 8 TO AUGUST 19
\$250 from Pinedale, Wyoming
Parties limited to 25

MAROON BELLS-SNOWMASS, COLORADO

JULY 25 AUGUST 3; AUGUST 4 TO AUGUST 13
\$230 from Glenwood Springs, Colorado
Parties limited to 25

SALMON-TRINITY ALPS WILDERNESS, CALIFORNIA

JULY 31 TO AUGUST 9
\$250 from Redding, California
Party limited to 20

YELLOWSTONE NATIONAL PARK, WYOMING

AUGUST 7 TO AUGUST 18
\$250 from Moran, Wyoming
Party limited to 25

TETON WILDERNESS, WYOMING

AUGUST 21 TO SEPTEMBER 1
\$250 from Moran, Wyoming
Party limited to 25

MT. WHITNEY-HIGH SIERRA, CALIFORNIA

AUGUST 23 TO SEPTEMBER 1
\$250 from Lone Pine, California
Party limited to 20

PECOS WILDERNESS, NEW MEXICO

SEPTEMBER 5 TO SEPTEMBER 15
\$235 from Santa Fe, New Mexico
Party limited to 25

Write or wire for detailed information, itineraries and reservations

919 Seventeenth Street, N.W.
Washington 6, D. C.

THE
AMERICAN FORESTRY
ASSOCIATION



There's more to a forest than meets the skies

Step bravely but softly into the land of the Three Bears or Big Bad Wolf. Here every little girl can be Goldilocks or Red Riding Hood. And every lad a Friar Tuck waiting for Robin Hood to step from behind a tree. ■ Every woods is a wonderland for children and their parents. But here there's no need to fear; no wolves incognito or Sheriffs of Nottingham tread these forest trails. This is not a nobleman's private hunting park but Scott's wood fiber farm, which provides pleasure and recreation while it grows trees. ■ Scott forests—industrial timberlands—have roads to aid the getting to and going through—trails to give asphalt hardened feet the soft feel of pine needles and maple leaves. ■ Scott welcomes visitors, not with the comforts of home, but with the rustic convenience of cared for timberlands. Understanding the public's interests, Scott and its foresters recognize that while trees are growing tomorrow's paper products, there's a lot of pleasure for a lot of people—more than 100,000 last year—under Scott's trees.



Philadelphia 13, Pa.

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